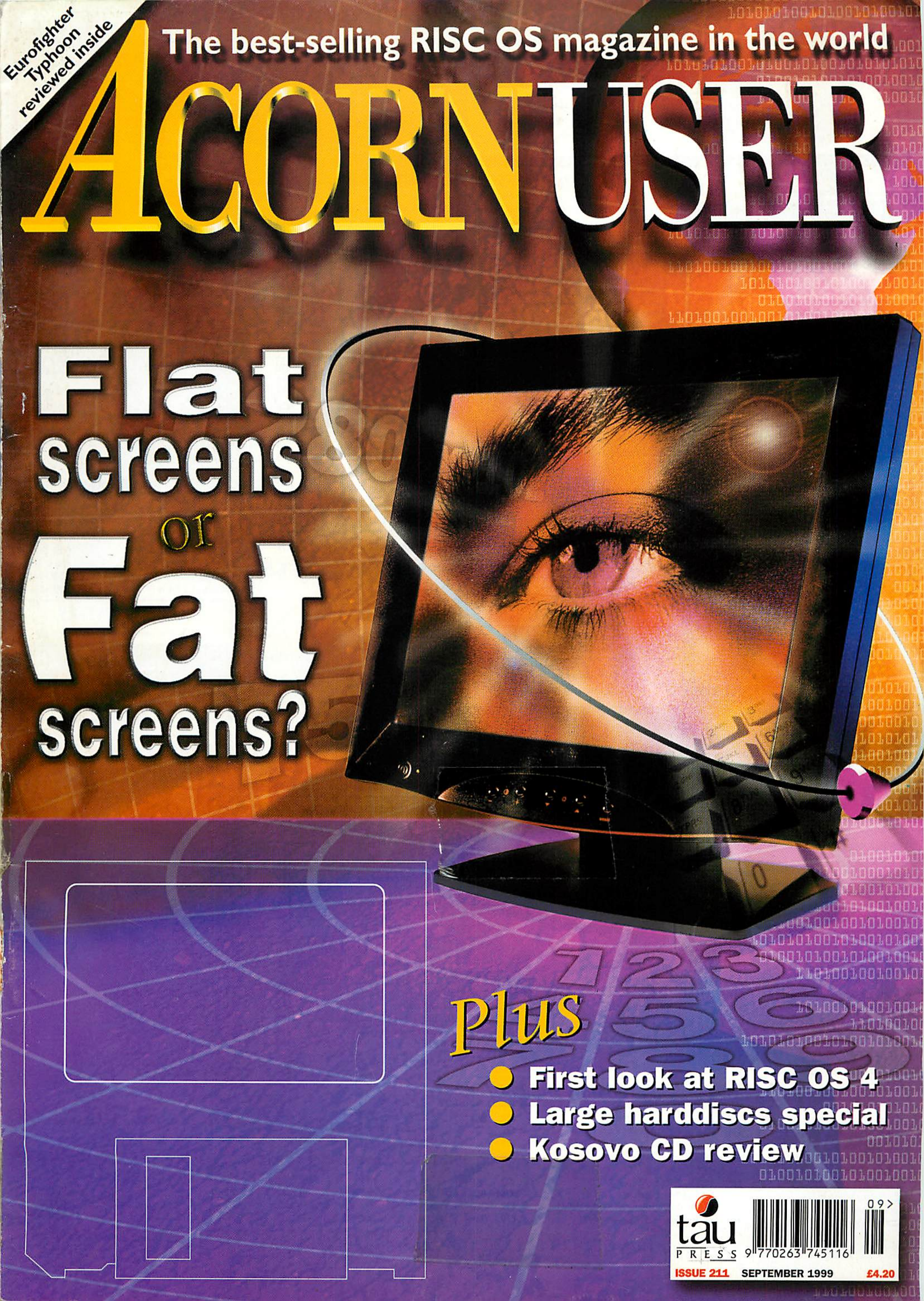

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INTERFACES

25% off when bought with drive or scanner etc

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Storm8 SCSI2 interface - A30x0 A4000	£88	£103.40
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Storm16/Combo SCSI2 & Ethernet i/f	£196	£230.30

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100MB 3.5" SCSI	£39	£45.83
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The unique Combo Case - takes any two SCSI devices & gets rid of all those cables, mains leads etc. Accepts any 5.25 unit.



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SCSI/IDE ribbon cables from	£5	£5.88
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For exceptional performance a guaranteed 4MB+/sec read transfer rate with Castle Storm 32-bit SCSI card

4GB Xtra SCSI internal	£169	£198.58
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inc FREE driver software & fixing kit worth £29

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16x4x4 Ext CD ReWriter inc !CDBurn	£334	£392.45
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8x CD & 500MB HD - external SCSI	£129	£151.58

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7 SCSI CD towers with lockable doors

Add the Castle Technology CD Tower to your network and have simultaneous access to between 7 & 28 CD-ROMs. Enables CD resource discs to remain locked and untouched but accessible from all over the network. Up to 4 towers can be connected to one computer. Fully compatible with Access CD network software.



8x CD 7 drive Tower	£379	£445.33
32x CD 7 drive Tower	£549	£645.08



SPECIAL OFFER!

128K ISDN MODEMS

Join the digital revolution at lightning fast speeds! Using a Castle Technology ISDN modem (connected to an Integrated Services Digital Network pair of lines from BT), you can take advantage of fast Web browsing, fast data transfer, fast faxing, and a hi-performance phone line – all from one hi-tech box! Choose from four network/stand-alone models at great prices!

Special offer from **£99** £116.33 inc VAT

KEYBOARDS MICE ETC

Ergo keyboard for pre Risc PC	£69	£81.08
Ergo keyboard for Risc PC A7000/+ N/C	£39	£45.83
Keyboard for Risc PC A7000/+ N/C	£19	£22.33
Keyboard cable (6 way)	£10	£11.75
Mouse for all Acorns (not A7000 etc)	£12	£14.10
Mouse for A7000/+ N/C	£12	£14.10
Mouse balls heavy (pack of 10)	£15	£17.63
Floppy drive any Acorn except A300 A4	£29	£34.08
Replacement floppy drive for A4	£79	£92.83

REMOVABLE DRIVES

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250MB ZIP drive external SCSI	£139	£163.33
Iomega Parallel ZIP driver (100MB)	£25	£29.38
MaxIT internal 500MB SCSI drive	£129	£151.58
JAZ 1GB external SCSI drive	£199	£233.83
SyJet internal 1.5GB SCSI drive	£219	£257.33
SyJet external 1.5GB SCSI drive	£255	£299.63
JAZ 2GB internal SCSI drive	£259	£304.33
JAZ 2GB external SCSI drive	£279	£327.83
PD 24x CD & 630MB optical SCSI drive	£249	£292.58

MEMORY

A300 & A400 1-4MB	£75	£88.13
A300 & A400 4-8MB	£99	£116.33
A3000 1-4MB	£55	£64.63
A3000 4-8MB	£124	£145.70
A3000 serial port upgrade	£23	£27.03
A3010 1-2MB	£25	£29.38
A3010 1-4MB	£55	£64.63
A3020 & A4000 2-4MB	£35	£41.13
A5000 2-4MB	£45	£52.88
A5000 4-8MB	£119	£139.83
16MB SIMM - Risc PC A7000/+	CALL	CALL
32MB SIMM - Risc PC A7000/+	CALL	CALL
64MB SIMM - Risc PC A7000/+	CALL	CALL
128MB SIMM - Risc PC A7000/+	CALL	CALL
Risc PC 2MB VRAM	£75	£88.13

SPECIAL OFFER

BJC 7000 – THE ULTIMATE COLOUR BUBBLE-JET PRINTER FROM CANON

This 4-colour bi-directional printer has a resolution of 1200x600dpi, and can print up to 4.5 ppm on paper up to A4+ size (so you can print right to the edge of A4) Choose from Canon's special hi-resolution papers & optional Photo Cartridge for Super PhotoReal quality prints. For sheer quality and durability, this has to be the one!



Special price only **£189** £222.08 inc VAT

PROCESSORS & RISC OS

Risc OS 3.11 chip set	£25	£29.38
Risc OS 3.11 manual set	£20	£23.50
Risc OS 3.11 hardware upgrade - A300	£20	£23.50
Risc OS 3.70 (Risc PC Only)	£55	£64.63
Risc OS 4 (RiscPC/A7000 when avail)	£99	£116.33
ARM 610 processor (2nd user)	£69	£81.08
ARM 3 processor for A3000 A300 A400	£115	£135.13

MODEMS

All modems are external and come with FREE on-line time

56k modem	£59	£69.33
128k ISDN modem	£99	£116.33
128k ISDN + 2 analogue phone ports	£109	£128.08
128k ISDN hub router with 10BaseT	£249	£292.58
128k ISDN modem router (managed)	£385	£452.38

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Zip 100MB media (6 pack)	£45	£52.88
Zip 250MB media	£14	£16.45
Syquest 105MB media	£45	£52.88
Syquest 135MB media	£45	£52.88
Syquest 230MB media	£45	£52.88
Syquest 270MB media	£45	£52.88
MaxIT 500MB media	£29	£34.08
Nomai 750MB media	£38	£44.65
JAZ 1GB media	£58	£68.15
SyJet 1.5GB media	£75	£88.13
JAZ 2GB media	£79	£92.83
PD 630MB media	£18	£21.15
CD 630MB write once media (Pk of 10)	£12	£14.10
CD 630MB re-write media	£10	£11.75

COLOUR MONITORS

3 year warranty on all monitors (1 year on AKF18)

The latest developments in TFT screen technology bring the ProLite 36 space-saving flat screens from Iiyama. The 14.1" screen has a viewable area almost 17" and a maximum resolution 1024x768. It is ecologically advanced with low power consumption and reduced eye strain. Suitable for schools or business.





AKF53 14" med res pre RiscPC	£149	£175.08
14" SVGA	£89	£104.58
15" digital SVGA	£110	£129.25
17" digital SVGA	£159	£186.83
15" digital SVGA Iiyama	£129	£151.58
17" digital SVGA Pro 0.25 Iiyama	£316	£371.30
21" digital SVGA Iiyama	£665	£781.38
14" colour LCD display (TFT Analogue)	£599	£703.83

INKJET PRINTERS

inc FREE data cable & Acorn driver worth £20

Advanced inkjet technology for bright colour images & fast printing times. Up to 1200dpi resolution (virtual photographic quality). Supplied with Acorn drivers & data cables.



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CANON BJC-2000	£100	£117.50
CANON BJC-4650 (A3)	£228	£267.90
CANON BJC-5000 (A3)	£189	£222.08
CANON BJC-7100	£229	£269.08
CANON BJC-6000	£199	£233.83
EPSON Stylus colour 440	£99	£116.33
EPSON Stylus colour 640	£124	£145.70
EPSON Stylus colour 850	£213	£250.28
Parallel printer cable	£10	£11.75
Acorn printer driver for any listed printer	£10	£11.75
TCP/IP (LPR) postscript printer driver	£175	£205.63

SPECIALS

DOA warranty only

JP150 sheet feeder	£10	£11.75
Master 128 motherboard	£10	£11.75
German keyboards RiscPC/A7000 etc	£10	£11.75
A5000 Power Supply Unit	£15	£17.63
SJ Econet Bridge	£20	£23.50
Acorn Econet interface - all except RPC	£5	£5.88
SJ Econet starter kit	£20	£23.50
PC card for A3000 A3010 A3020 A4000	£99	£116.33
A-link for pocket book (AHA30)	£25	£29.38
Risc PC sound card (ACD05)	£20	£23.50

DELIVERY CHARGES - Next day insured

Orders over £200 paid by debit card	FREE	FREE
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All other orders	£11	£12.93
Fitting charge (inc collection)	£18	£21.15

We welcome payment by cheque (allow 5 days to clear), Credit and Debit cards.

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ACORN USER

Features

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Education

Next month
Flat screen monitors, we put five on test; font programs from EFF checked out; more on how to do OOP plus all the regulars and more besides
On sale 2nd September 1999

Reviews

Hands on

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R7500 50 mip PCI based system with 16M / 4.3G / 40x CD /14" mon & Stereo Spk for only £649 exc vat (£762.58)
FREE Software Bundle
Due August 1999
See www.riscstation.co.uk for details

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SA J233 Web Wizard

2M+32Mb/4G/40x CD/15" mon/stereo Spk, inc !Browse, Jarva and Word 6/7 compatibility & 56K modem for only **£1145 + VAT**

Available now

A7000 + Peak Performer



29 Mips 16M / 4G / 40x CD / 15" mon & Stereo Spk free software bundle £699 + VAT or £21.00 / month on L.C.F.
(£789 + VAT for internet bundle)
8Mb bases from £499 + VAT

internet bundle includes 56K modem and Ant internet suite

add £99.00 + vat for Flash upgradeable network card

Please ask for other combinations

Desktop FAX MODEMS

56k x2/V90 3Com USR	£118.30	£129.00
56k Flex/V90 (Rockwell)	£55.32	£65.00
ISDN modem (external)	£99.00	£116.33
High speed serial cards from	£67.23	£79.00

Internet & Modem Software

ANT Internet Suite	£94.05	£110.51
Webster XL	£21.28	£25.00
!Java CD	£33.19	£39.00
ArcFax Fax software	£26.38	£31.00

MONITORS

All monitors inc 3 yrs wty unless specified

	Ex VAT	Inc VAT
14" SVGA 0.28 (3yr on-site)	£85.00	£104.58
14" SVGA 0.28 Multi-Media	£99.00	£116.33
15" SVGA 0.28 (3yr on-site)	£99.00	£116.33
15" SVGA 0.28 Multi-Media	£129.00	£151.57
15" Iiyama Vision Master 350	£125.00	£151.27
17" SVGA 0.28 (1yr RTB)	£149.00	£175.08
17" SVGA 0.28 (3yr on-site)	£170.00	£199.75
17" SVGA 0.28 m-media(3yr)	£190.00	£223.25
17" Iiyama Vision Master 702	£235.00	£276.13
17" Iiyama Pro 400	£279.00	£327.83
19" SVGA 0.26 (1yr RTB)	£280.00	£329.00
19" SVGA 0.26 (3yr on-site)	£360.00	£423.00
19" Iiyama Pro 450	£455.00	£534.63
21" SVGA 0.25 (3yr on-site)	£540.00	£634.50
21" Iiyama Pro Diamondtron	£659.00	£774.33
38" SVGA (1yr on-site)	£1500.00	£1762.50
AKF53 Multisync 14" 1yrRTB	£160.00	£188.00
AKF50 Multisync 14" 1yrRTB	£195.00	£229.13
AKF12 PAL 14" refurb 90 days	£65.00	£76.38
AKF52/53 M/sync refurb 90 days	£99.00	£116.33
AKF60 SVGA 14" refurb 90days	£65.00	£76.38
Multisync A300/A3000 cable	£8.50	£9.99

*Ask about 2nd user mon's available with 90 days WTY

THE BEST PRINTER PRICES

(Please ring for latest prices)

		Ex VAT	Inc VAT
Canon BJC 1000 colour	A4	£77.00	£90.48
Canon BJC 2000 colour #	A4	£89.00	£104.58
Canon BJC 2000 Scan # !	A4	£158.00	£185.65
Canon BJC 4650 colour #	A3	£228.00	£267.90
Canon BJC 4650 Scan # !	A3	£275.00	£323.13
Canon BJC 7000 colour #	A4	£169.00	£198.58
Epson Stylus 440 colour	A4	£85.00	£99.88
Epson Stylus 640 colour	A4	£99.00	£116.33
Epson Stylus 850 colour	A4	£195.00	£229.13
Epson Stylus 1520 colour	A3	£350.00	£411.25
Epson Stylus Photo 700 #	A4	£135.00	£158.63
Epson Stylus Photo EX #	A3	£265.00	£311.38
HP 420C	A4	£69.00	£81.08
HP 610C colour	A4	£75.00	£88.13
HP 895CXI colour	A4	£200.00	£235.00
HP LASERJET 1100		£249.00	£292.58
HP LASERJET 2100		£454.00	£533.45
Photo drivers for #		£58.72	£69.00
Scanner drivers for !		£29.79	£35.00

FREE Acorn driver by request

Casio QV100 Digital Camera



PC s/w only £170.00 exc vat (£199.75)
Acorn & PC s/w £255.00 (£299.63)
Qv11a/Qv100 s/w kit £96 (£112.80)

HARD DRIVES AND SUB-SYSTEMS *WHY PAY MORE???*

A3000/A3010			A3020		A4000/A5000/A400			RPC / A7000 / RiscStation		
	Ex. VAT	Inc. VAT	Ex. VAT	Inc. VAT		Ex. VAT	Inc. VAT		Ex. VAT	Inc. VAT
170Mb	£95	£111.63	£49	£57.58	210Mb refurb	£25	£29.38	210Mb refurb	£25	£29.38
340Mb	£112	£131.60	£65	£76.38	420Mb	£40	£47.00	512Mb	£50	£58.75
512Mb	£127	£149.23	£79	£92.83	540Mb	£49	£57.58	3.2Gb	£60	£70.50
810Mb	£135	£158.63	# £109	£128.08	730Mb	* £80	£94.00	4.3Gb	£70	£70.50
1Gb	£145	£170.38	# £119	£139.83	1.2Gb	* £95	£111.63	6.4Gb	£80	£94.00
2Gb	£155	£182.13	# £129	£151.58	2.1Gb	* £100	£117.50	8.4Gb	£90	£105.75
3Gb	£165	£193.88	# £139	£163.33	3.2Gb	* £105	£123.38	16.8Gb	£145	£170.38
4Gb	£175	£205.63	# £149	£175.08	4.0Gb	* £115	£135.13	25.0Gb	£255	£299.63

A3000/A3010 version includes CD ROM i/f which can also be used in A3020 or A4000. For external A3000 i/f add £20.00 +VAT
includes partitioning software

* inc. internal removable HD & CD ROM i/f.
For partitioning software only deduct £25.00 + vat (£29.38)

Partitioning software for RISCOS 3.5/.6/.7 only £25.00 + vat (£29.38)



ACORN TRACKBALL & MOUSE
£29.79 + VAT

CD-ROMS

IDE			SCSI		
40x	£39.00	(£45.83)	40x	£65.00	(£76.38)
24x	£35.00	(£41.13)	32x	£55.00	(£64.63)
8x	£30.00	(£35.25)	8x	£30.00	(£35.25)

For external IDE or SCSI 1 add £50.00 + VAT (inc.cable)
For external SCSI II add £55.00 + Vat. (inc. cable)
IDE driver for RiscOS 3.5 £15 + vat
IDE int. fitting kit £5 inc. Int. SCSI fitting kits from £10 + vat

SCSI HARD DRIVES

540Mb # limited supply	£50.00	(£58.75)
1Gb	£60.00	(£70.50)
2Gb (5400 rpm)	£90.00	(£105.75)
2Gb (7200 rpm) #	£100.00	(£117.50)
4.3Gb (5400 or 7200rpm)	£140.00	(£164.50)
9.1Gb (7200rpm)	£235.00	(£276.13)
18.6Bg (7200 rpm)	£425.00	(£499.38)

For EXT. SCSI 1 case £50.00 + VAT (inc. cable)
For EXT. SCSI II case £55.00 + VAT (inc. cable)

CD-ROM WRITES



Prices Start from £170.00 +

2x2x6x	£170.00	(£199.75)
4x4x16x	£235.00	(£276.13)
CD-BURN	**£49.00**	**(£57.58)**
CD-SCRIBE 2	**£49.00**	**(£57.58)**



SCSI 8x
Autochanger
£85.00 + vat
(£99.88)

IDE Removable Drives

IDE drives require suitable drivers or hardware

Zip 100 int	£65.00	(£76.38)
Zip 250 int	POA	POA

Parallel Removable Drives

Parallel drives include Acorn Software

Zip 100	£110.00	(£129.25)
Zip 250	£159.00	(£186.83)
Jaz 1G	£239.00	(£280.83)
Jaz 2G	£299.00	(£351.33)

SCSI Removable Drives

Zip 100 M int	£85.00	(£99.88)
Zip 100 M ext	£85.00	(£99.88)
Zip 250 M int	£135.00	(£158.63)
Zip 250 M ext	£135.00	(£158.63)
PD650/CD	£139.00	(£163.33)
Nomai 750	£165.00	(£193.88)
Jaz 1G int	£189.00	(£222.08)
Jaz 1G ext	£199.00	(£233.83)
Syjet 1.5G int	£199.00	(£233.83)
Jaz 2G int	£249.00	(£292.58)
Jaz 2G ext	£249.00	(£292.58)

Removable Drive Media

	ex VAT	inc VAT		ex VAT	inc VAT
100Mb Zip	£8.00	£9.40	5.2Gb DVD RAM	£25.00	£29.38
Zip 5 pack	£35.00	£41.13			
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RISC OS 4 launch

RISC OS 4 has arrived. The launch took place at a hotel near Birmingham on Thursday 1st July with the RISCOS Ltd. team all present in their regulation green company sweatshirts. A limited number of ROMs were available at the event for press and developers, with the main shipping effort kicking off in the week beginning 5th July. It's expected that thousands of RISC OS 4 orders will be processed by the end of the year. Many already exist in the form of advanced orders.

Talks were given by Paul Middleton, green man in charge of commercial and sales issues and also by Andrew Rawnsley, the company's technical supremo. The two full-time programmers, Justin Fletcher and Matthew Bullock, were also present in their grass shirts. Paul was keen to make it clear that the recent take-over of parts of E-14 by Pace Microtechnologies was to secure the services of the elite programming and engineering staff working at E-14's Cambridge base.

It had been speculated that they were interested in RISC OS or related technologies, but this does not appear to be their primary motive. This is both a good and a bad thing – it's good because RISCOS Ltd should be able to do pretty much as they please with the future development and marketing of RISC OS, unhindered by a third party jealously looking over their shoulders. However, as Pace is a pretty huge and busy company, RISCOS Ltd's issues fall fairly far down their list of priorities. So whenever RISCOS Ltd needs approval for a new strategy from Pace, it will need to exercise considerable patience.

The upgrade is still set to sell for a total of £120 inc.VAT with the majority of new features remaining as published in the June issue of *Acorn User*.

Key goodies, for those who might need reminding include a performance boost for pre-StrongARM machines; a new-look desktop; long filenames and the ability to address huge harddiscs, with LFAU block sizes which save space compared to the old FS (see various articles in this issue). One new development is the use of Flash ROM chips rather than conventional ROMs as used by Acorn. Flash ROMs are more expensive than conventional ROMs, but as production runs are relatively small, the use of Flash ROMs is actually more cost-effective in this case.

However, this does not mean that future operating system upgrades will be distributed on disc or over the Internet because RISCOS Ltd's contract with Pace currently outlaws such practice, meaning that ROMs will have to be returned to an authorised installer for upgrading.

RISCOS Ltd. has appointed a network of authorised installers who will fit the upgrade for a reasonable fee and also transfer your harddisc to the new format allowing the use of long filenames.

The upgrade is relatively simple to execute for more experienced users but those lacking an extra harddisc or external device to back up their work may find it easier to go to one of the authorised installers.



RISC OS 4.0 is, by no means, the end of the line for RISCOS Ltd. The team is now hard at work liaising with the various new hardware ventures to ensure that RISC OS will soon contain the necessary features to support such things as the new 600MHz StrongARM chips and other developments which require the holy grail of hardware independence to be reached.

Finally, you may have noticed that up to this point the word 'Acorn' hasn't been mentioned in this story once. Gone is the familiar old friend in the form of the Acorn nut on the iconbar. RISC OS 4 is not an Acorn product, hence the absence of Acorn branding.

That's a significant point of historical interest: Acorn's history has ended, but RISCOS Ltd's has just begun.

Alasdair Bailey



StrongARM to out-sell Pentium

As it stands today, the RISC OS community looks up to Intel and the StrongARM architecture it acquired from Digital Semiconductor last year. StrongARM remains a much more attractive workstation processor than the alternatives from the mother company, ARM Ltd, and its partners. ARM Ltd is, quite rightly, focussing on low power units, like embedded applications and mobile phones.

So it was with some pleasure that RISC OS fans greeted the recent news that Intel, despite its own philosophical problems over developing an 'alien' technology, is now firmly committed to StrongARM's future. Indeed, with the double-whammy of suitability for workstation-like applications and low power embedded designs, it has been conceded that StrongARM volumes could eventually overtake those of its step-sibling, the Pentium platform.

Craig Barrett, Intel's CEO, couldn't answer the question of when StrongARM would be the best selling Intel CPU, but he didn't deny it was a possibility: "I haven't the foggiest idea when StrongARM will surpass Pentium. We'll push StrongARM into all these spaces where its characteristics are best". StrongARM is already making inroads into the Windows CE portable computer market, with the likes of Hewlett-Packard choosing StrongARM for certain of its Jornada CE models. Meanwhile, there is also talk of porting RISC OS to StrongARM-based machines originally designed for Windows CE, like the HP Jornada.

ARM shares soar

ARM Ltd shares rose by over 300p in July to a new £10.00 plus mark since the last dilution of the share price. This represented a jump of roughly 50% in a short space of time. The price rocket was launched off the back of rumours that Texas Instruments, one of the big semiconductor players, was going to licence future ARM technologies.

Quite why the rise was so strong is slightly mysterious, unless you subscribe to the theory that Texas wants in on the company as well. For the record, TI has previously licensed ARM technology for its automotive products division; engine management systems and the like – with potential volumes in the several millions per year. However, that was around five years ago and well before ARM Ltd's flotation. ARM Ltd itself made an official statement on the share movement:

"The Board of ARM Holdings plc confirms that it is in discussions with several licensees, including Texas Instruments. These discussions may or may not lead to existing partners licensing the next generation of ARM technology. Discussions with all of our partners are continuing and shareholders will be kept informed of material developments as they occur. The Company understands that its shares have also recently received positive comments from brokers. The Company is unaware of any other factors which it should bring to the attention of shareholders."

Fresco SSL update

Last month we brought news that the lack of a crucial module for secure browsing was suddenly preventing ANT *Fresco* users from doing such mundane things as using Hotmail on the Web.

The desktop version of the *Fresco* browser is not supplied with the SSL (Secure Sockets Layer) module which is required for communicating with secure servers on the Web. Hotmail recently switched to SSL in the interests of security, locking *Fresco* users out. The irony is that an SSL module for *Fresco* does exist and is apparently widely pirated, but neither ANT, nor the suite's guardians since March – Argo Interactive, have yet decided if, or how to distribute the module to desktop users.

Our information is that it's ANT who are dragging their feet. Argo Interactive took over the support and distribution of the ANT *Internet suite* to general RISC OS users at the beginning of March, but the maintenance and development remains the responsibility of ANT Ltd.

On a separate note, Argo Interactive have indicated that despite initial concerns with an earlier release of JavaScript support for *Fresco*, a recently received update is much more robust and should be released to ANT users soon.

This is also good news for Argo *Voyager Browse* users, as essentially the same code will be used for their package as well.

Argo Interactive, Web: http://www.argonet.co.uk



Millipede Imago board

RISC OS power users were left salivating recently when Millipede Electronic Graphics revealed considerable detail about its new Risc PC motherboard, code-named Imago. Even better was the news that the first working prototype was expected before the end of July and development samples were scheduled for October, with commercial shipments hoped for early in the new year – a Millennium event if ever there was one.

Millipede's own data includes the following information about the Imago board:

- On-board StrongARM revision T with processor upgrade connector
- 64MHz local memory bus
- Up to 512Mb SDRAM in two industry standard SO-DIMMs
- 16Mb flash memory
- Very high resolution video – 1800x1400 typical
- Enhanced SoundBlaster compatible sound processing
- Game port with joystick and MIDI I/O
- Built-in 100Base-TX Ethernet
- Dual EIDE port to support up to four devices
- Dual serial ports (RS232 and RS422/RS485) up to 460kb/s
- Dual USB port
- PS/2 mouse and keyboard interface
- Audio/video expansion bus with four real-time video streams
- Standard podule bus with enhanced data rate
- Additional decoded podule connector
- Standard processor expansion connector for PC card

As previously revealed, out go the old Acorn custom ICs including VIDC and IOMD. These are replaced by two enormous custom-designed FPGAs (field programmable gate arrays). In many ways, this design goes a lot further than the defunct Phoebe/Risc PC 2.

Earlier indications suggested that there wouldn't be support for the old PC processor card, but this now features on the latest design, though there isn't any support for a more up-to-date Pentium processor. Like Phoebe, the main bus is designed to be clocked at 64MHz.

Millipede is a video graphics company which works with broadcasting companies to create fancy on-screen graphics, so the graphics capability of Imago was always a very high priority. 1800x1400 pixel resolution at a refresh rate of 80Hz outperforms most monitors on the market today. Video memory, like the old Archimedes and, indeed, the original BBC Micro, is stored in the same SRAM memory as programs, unlike the Risc PC which used separate VRAM. The video system also supports standard VESA DDC plug and play devices.

Sound is also looking good (sic), with support for all-digital I2S inputs, the choice of a SoundBlaster compatible synthesiser chip and the provision of expansion to a DSP if required.

Elsewhere, UltraDMA IDE devices, like harddiscs, will be supported, there will be USB (universal serial bus) support, two conventional serial ports and a PC-style MIDI/game port. Millipede have also engineered an expansion capability for extra video graphic processing hardware, in line with their broadcast video business requirements.

A lot hinges around the performance and availability of Millipede's two FPGA custom chips. The board won't be cheap, but it will offer a great deal to power users. Millipede also expects customers to fit the new board into cases of their own design, possibly in an OEM relationship.

The final teaser is that Millipede says the board will be finished in a particularly tasteless colour instead of the typical green. We've seen pink, browny-yellow and blue elsewhere, so Millipede's choice should be interesting!

Millipede's Website is at: http://www.millipede.co.uk

Orb grabs Syquest crown?

Syquest, the removable harddisc drive manufacturer is no more. The company folded late last year, much to the disappointment of many *Acorn User* readers.



However, a remarkably similar, but unrelated, alternative has just started shipping in the UK – it's called the Orb and comes from a company called Castlewood in the US.

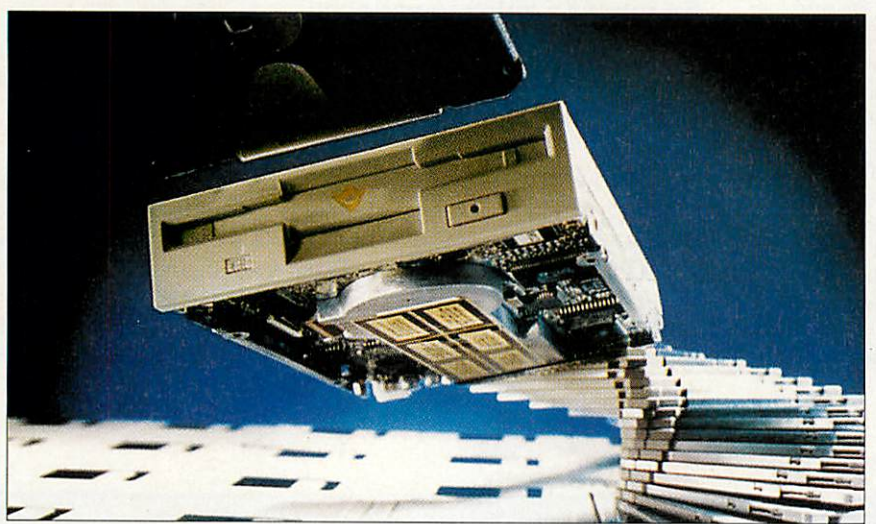
We first saw the Orb product two years ago in development form, so it has taken a long time in coming. The Orb is a 3.5 inch removable harddisc cartridge with a capacity of 2.2Gb per cartridge, though it's not SyQuest compatible. Performance is very good, at up to 12.2Mb/second. Cartridges cost £30 each.

Headerless IDs mean the cartridges don't require time-consuming formatting, too – though whether this feature extends to RISC OS isn't clear.

Datek is one distributor of Orb products in the UK; they can be contacted at, tel: 01494 637 499.

Double-speed SuperDisk

SuperDisk, also known as LS 120, has become established as a strong competitor to Iomega's Zip drive technology and is being offered by some Acorn dealers in RISC OS form. SuperDisk's advantages over Zip include 120Mb storage capacity compared to Zip's 100Mb and backwards compatibility with the familiar old 3.5 inch floppy disc. The one Achilles heal of SuperDisk has been performance – it's faster at reading an ordinary 3.5 inch floppy than a typical floppy disc drive, but it's markedly slower than Zip and even more so than Sony's new, but troubled HiFD super-floppy platform.



Panasonic has partially cured that problem by introducing a new 2X SD120S SuperDisk drive, which – as its name suggests, is twice as fast as its predecessor, making it competitive with Zip for the first time.

Panasonic adds that compared to an ordinary floppy drive, their new 2X SuperDisk can read standard floppy discs ten times faster and write three times faster. SuperDisk data transfer rates can now hit 1360K/second. The drive connects to the host computer's IDE interface.

Panasonic UK, tel: 0800 444 220

Ex-Acorn employees unite!

Kevin Coleman, former marketing communications director at Acorn, has set up an exclusive club for ex-employees of Acorn.

To qualify, you need to have been on the Acorn payroll at some point. The line stops at those who may have contracted for Acorn via an agency – in other words they were paid by the agency rather than Acorn directly.

Coleman explained: "This is a club for those ex-Acorn employees who want to talk to each other, share expertise, network, and reminisce about the good old days. This is a very positive bunch of people who know that they have moved on in their careers but realise they were part of a company that made history and was full of innovation.

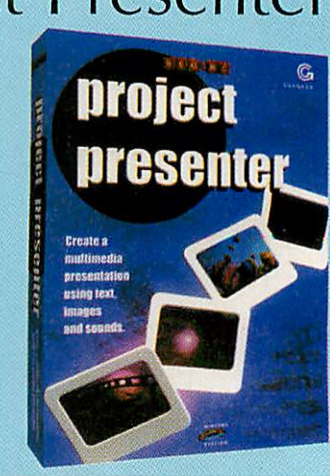
We were privileged to work with a bunch of highly intelligent professionals who were among the best in the industry."

Apparently, there could be as many as 2,000 eligible members now spread throughout the industry and around the world. Currently, there are about 150 members who have already attended two club meetings, the latest of which was held on 4th July. Coleman added: "One of the nice things is that now we don't see each other in a work environment every day, even some of those who didn't get on now take on a new and positive view." If you think you qualify and you would like more details, contact Kevin Coleman via e-mail at: kevin.coleman@dial.pipex.com

SEMERC Project Presenter

Granada Learning's SEMERC division has announced *Project Presenter*, a new multimedia presentation package available for both RISC OS and Windows. Designed for Key Stage 2 and above, the package uses extensive drag and drop capabilities for constructing multimedia presentations with a choice of special effects.

The single-user version is priced £29 + VAT and there is an additional licensing arrangement of £10 per head. SEMERC, tel: 0161 827 2927, e-mail: margaret.thompson@granadamedia.co.uk



Dave Clare to retire

Dave Clare, for so long the figurehead of Clares Micro Supplies and an ever-present personality at Acorn shows since the early-80s, has been forced to retire from day to day activity at the office on the advice of his doctors. Clares will continue to function as usual in his absence in the capable hands of David Jackson and Christopher Dean, but Dave won't be disappearing entirely from the scene and hopes to meet up with his many friends at future shows when and where possible.

He'll also be keeping a keen eye on what's going on via the Internet. In his own words: "As many of you will know, I have been struggling with ill health for a number of years and it has come to the point were my body has had enough.

"Over the last couple of years I have been finding it tougher and tougher to carry on but thanks to David and Chris we managed to keep things going." *Acorn User* wishes Dave all the best in his well-earned retirement.

Mico makes it

At Wakefield in May, on the Microdigital stand, we saw an impressive looking Mico motherboard, albeit *sans* chips and an impressive pile of empty PC cases, but there was no working machine.

The good news is that the first Mico is now up and running, with RISC OS 4. The first working machine has already been on a tour of the Acorn/RISC OS press.

Microdigital's David Atkins commented: "Those of you who know the amount of work which goes into developing complex electronic designs, will appreciate that it's far too early to be publishing comparative speed tests. However we are very pleased with the reliability being achieved and the general feel of the system in speed terms is very good.

"While the system is working and the hardware design is frozen, it will be some weeks before Mico is ready to ship. This is because tasks such as writing the User Manual and packaging design have only just begun."

Dealers are already taking orders and more information can be found at the Microdigital Website: www.microdigital.co.uk

OvationPro

From the 1st of July 1999, publication of the *OvationPro* DTP package will be taken over by its author, David Pilling, from the original publishers, Beebug. All contact regarding sales, support and any related issues should in future be directed to David.

He commented: "By buying *OvationPro* off Beebug, I hope to ensure that it will be developed further in the future. The first improvements are likely to be in 'large image handling' (allowing large images to be kept on disc separately from documents), and the implementation of graduated fills."

David has taken the opportunity to add some value to the package and revise prices at the same time. In future, all copies will come with the colour publishing supplement – formerly sold separately.

New prices are: *OvationPro*: £150 inc.VAT, *Ovation* upgrade: £140 inc.VAT, Site licence: £300. All prices include VAT in the EU, and air mail delivery where appropriate.

The *OvationPro* Website has moved to www.pilling.demon.co.uk/ovationpro. The *OvationPro* mail list will continue to operate as before.

You can e-mail David Pilling at david@pilling.demon.co.uk. His postal address is P.O. Box 22, Thornton Cleveleys, Blackpool. FY5 1LR. UK.

In brief

Mini Mouse

No – nothing to do with Disney characters, but a mouse which is designed to suit those with smaller hands. The Trekcom Mini Mouse uses a high-quality optical mechanism and is two thirds the size of your average mouse. Apparently, according to US researchers, smaller mice can help some people avoid repetitive strain injury. You can also choose from a number of fruity colours, including tangerine, orange, strawberry, lime, blueberry, turquoise, blue and white. They are priced £12.99 each. Master Enterprise Ltd, tel: 0181 830 7788

Kosovo appeal

Paul Johnson's Kosovo CD appeal goes from strength to strength. Early in July Paul reported that over £1,600 had been raised for charities involved in Kosovo. He added: "I'm estimating that when I get the numbers from CTA, CJE and APDL, the amount will be well over two grand." The £6.75 (minimum donation, including UK P&P) CD contains 600Mb of programs, including a number of commercial titles.

The war in the Balkans may now be over, but the cause remains as strong as ever. Paul Johnson can be contacted at paul@physchem.freeserve.co.uk, or CDs can be ordered from Clares, *Archive Magazine*, APDL or Paul directly, though if you wish to pay by credit card, you should order from one of the first three. Clares is equipped to deal with foreign orders, for which there will be an additional shipping charge. The aim is to send at least £5 to Kosovo charities for each CD sold.

Re-vamped Castle Website

Castle Technology Ltd (CTL), the official Acorn products distributor, has re-designed its Website and taken on a new Web address: http://www.castle.org.uk. The site contains information about CTL's entire range of Acorn branded products and other Acorn-related news.

CTL also manufactures selected Acorn items. With the focus moving towards RISCOS Ltd's Acorn-less branding of RISC OS 4, it's rather moving to see all those Acorn logos on the CTL site.

Getting up to speed

"This is an easy one" said the cheery BT engineer as he unpacked the neat Home Highway box. "One day last week," he went on, "I had a lady who wanted the Internet upstairs and I ended up having to rewire her whole house."

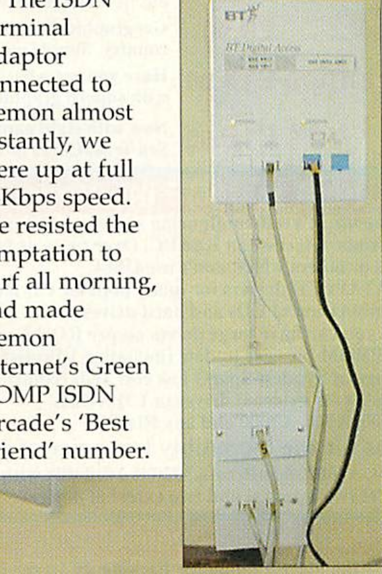
Ours was easy for him because we had just rewired the previous BT installation ourselves, reducing it neatly to one single and one double phone socket.

We'd decided to go for BT's half-price Highway conversion offer, which has been extended to the end of September. By *converting* one analogue Arcade BBS phone line to digital access, we'd gain a second line with a new number, as well as surpassing V.90 modem speeds with a simultaneous 64Kbps duplex weekend Internet connection.

Although the Highway box can be up to 30 metres from the main phone socket, ours was only a few centimetres away, so the engineer gave 29.5 metres of BT's best CAT5 cable to a good home. Two screws in the wall and a few clicks of an insulation displacement tool later and he was away to the exchange to set up the new circuits. We connected a spare Atomwide serial port on Arcade's Risc PC to a BT Ignition Terminal Adaptor, plugged into the blue digital Highway sockets and waited for the engineer's return.

I set up *SlipDial* by Graham Allan to dial Demon's ISDN number with a script that specifies the PPP protocol and turns off their four minute inactivity time-out during our six-hour weekend calls. The engineer reappeared, checked out the lines and said "It's all working" and indeed the green 'Service' LED was now lit.

The ISDN Terminal Adaptor connected to Demon almost instantly, we were up at full 64Kbps speed. We resisted the temptation to surf all morning, and made Demon Internet's Green ROMP ISDN Arcade's 'Best Friend' number.





In brief

Read it again, Sam

Deja News **is the Website where you can search for any Usenet newsgroup article by keyword. Recent design changes have made it slower to use, but the Power Search page at http://www.deja.com/=dnc/home_ps.shtml gives you results in the old bandwidth-saving format. Other newsgroup sites include** ***NewsOne*.Net at http://newsone.net/ for easy online newsreading, and** ***Reference*.COM at http://www.reference.com/ for searching, although no-one at** ***Reference*.COM has noticed that their cgi script displays itself rather than executing!**

Remarq **at http://www.remarq.com/ gives global usenet access, and their search engine finds newsgroups or messages. A message search returns links to threads containing the keywords, but I couldn't find a way to search a particular newsgroup for a keyword.**

All change

Vince Hudd's ***WebChange2*** **is designed to help Web designers who hand-edit their HTML. The program operates on the local copy of your Website, making global changes as necessary. Features include Search and Replace on every page; HTML tag case conversion, ALT text check in case you've missed any; file size references; visible 'Last modified' datestamps on pages; and creation of a file of page URLs for easy submission to the W3C service at http://validator. w3.org/**

WebChange2 **is available in a free 'Lite' version from the Soft Rock Website. The full version costs £12 by mail order from Soft Rock Software, FREEPOST (BS 7978), Westbury-on-Trym, Bristol, BS10 7BR.**

WebChange2
http://www.softrock.co.uk/webchange/

Contacting me

You can contact me David Dade at: comms@acornuser.com

3.5" IDE Hard Discs

	Drive	Plus i/face
210 Mb	£39	£81
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3.2 Gb	£85	£133
4.2 Gb	£93	£140
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8.2 Gb	£117	£164
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'Plus i/face' price includes an APDL fast IDE interface.

Part-exchange available if you need a bigger drive. Please phone for prices.

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30 Mb	£36	£79
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170 Mb	£60	£110
210 Mb	£66	£116
250 Mb	£72	£122
330 Mb	£79	£129
420 Mb	£86	£136
512 Mb	£93	£143
1.8 Gb	-	£149

A3010/3000 includes APDL IDE interface, A3020 includes fitting kit Larger sizes and HD+CD available



Is here!

The ultimate super fast IDE interface for your Risc PC. Over 7 M/b per second! See separated advert on page 9

SCSI Hard Discs

210 Mb	£29
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1 Gb	£74
4.2 Gb h/h	£149
4.2 Gb	£159
8.7 Gb h/h	£249

IDE CD ROM drives

Internal

Drive with all cables and drivers for RO 3.6+ where required

36x	£47
40x	£49

Drive including APDL IDE interface

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Drive in case with power supply and including an APDL IDE interface. Probably the best way to fit a CD to a pre- RISC-PC machine.

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CD ROM driver software

Works with most ATAPI CDs eg..Pioneer Goldstar, Panasonic, Lite-on, Mitsumi, Sony, Hitachi, NEC, Toshiba, Sanyo, etc. Includes CDFS for use with RO 3.5. Intended for RPC but can be used with an A5000. Only £8 or £7 with a drive

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128 Mb *from*	£159
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1 Mb to 2 Mb exchange	£47

Datafile PD CDs

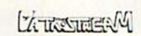
PD CD - 3	£6.50
PD CD - 4	£8.50
PD CD - 5	£6.50

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The 1Gb SparQ drive is the ideal solution for backing up larger hard drives where old technology like a Zip drive just isn't realistic. Big enough to hold lots of data, and with our software you aren't restricted to just RISC-OS 3.6+ but can use it on any machine with a bi-directional printer port including the A5000, A3010 etc. as well. With Acorn and DOS driver software. just £199

Ancestor +

We've promised it before, but it's available at last! The long awaited successor to Graham Crow's highly popular genealogy program Ancestry, previously sold by Minerva. Upgrades from Ancestry 1 and Ancestry 2 available. Can use Ancestry 1 files and we're working on a converter for Ancestry 2. Only £59

ACE 586 PC cards

Available with 128K cache from just £199 or 512K cache from £299. We can offer a trade in against your old card, which makes it even cheaper. Good performance for Windows at a sensible APDL price.

General software

Faster PC - £20 The alternative XT PC emulator. Works on any model with 2Mb RAM from A3000 to Strong ARM RPC.

PowerBase - £15 Popular extremely powerful but very easy to use database. With examples, tutorials and printed manuals. Better than most products costing many times the price. Does everything that 99% of database users will ever need.

MenuBar - £15 The very best pull-down menu system. An absolute essential for any hard disc user. You can switch between up to 30 different menu bars. Incredibly easy to set up, add items to menus, move them, etc.

Tiger - £15 Lets you use very long descriptive filenames. Unlike some products this is very robust as it works in parallel with the filer so can't corrupt discs.

WorkTop - £15 Switch between up to 30 different environments with a single mouse click. Stars the tasks you require, opens directories, loads files, changes screen mode. Just like moving to another computer. An essential productivity tool.

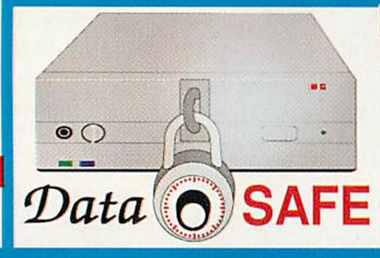
Joy Connect joystick podule

Works with most games. Podule with one joystick £42 Extra joysticks £6 each.

Connect 32 fast SCSI

We have a limited number of these very fast interfaces (up to 7.5 Mb/sec) at only £109

Data Safe - A new concept in backup and data security



A new idea from APDL, Data Safe consists of an external case to hold a 3.5" IDE hard drive, connected to your machine's printer port. This gives a large capacity portable drive, movable between machines and locations. Ideal for backup, secure data storage and transport. The filer has all the features of our ideA card so you can partition drives, password protect partitions, etc. Great for schools. Supply your own drive or we'll fit one for you.

Data Safe *Super* has the drive fitted in a removable drawer. You can fit a similar drawer to your Risc PC (best if you use our IDE card) and then just unplug the drive from the RPC and transfer data to another machine using the Data Safe.

Prices start at £104 or with a 3.2Gb drive from just £195



Loadsastuff

Well this month I've managed to fit on twelve PD programs; two small sillies, one from *INFO and one from last month's PD page; a replacement set of RISC OS 4 sprites; the complete AAUG information table which we were unable to put on the August disc; the latest RISC OS 4 compatibility lists as compiled by Paul F Johnson (and no you don't need *WBModules* to view them) plus replies from RISCOS Ltd; and all the software to accompany the ongoing series' in the magazine.

You even get a set of bitmap masks prepared by Walter Briggs so you can follow along with his 'Photodesk' tutorial. All in all there's quite a bit of stuff there.

I was asked by a gentleman at the South East show to included a text file on the disc outlining what cover disc programs would run on what computers.

He was tired of de-archiving a program only to find it didn't run on his A4000. Unfortunately this is harder than it seems, the lowest spec machine we have here is an A7000, and unless authors state that their programs won't work on such and such machine then I can't tell.

AutoLock

This small utility will ensure that certain files get locked automatically every time you shutdown your computer.

This can be useful for safeguarding files from being accidentally overwritten in the future – they will have to be specifically unlocked before you can save them again.

AutoLock should be placed in your *!Boot.Choices.Boot.Tasks* directory. It uses very little memory and processor power and, once installed, can be conveniently ignored.

It just sits in the background waiting to be quit, upon which it locks all the files in specified directories and their subdirectories.

Temp-Bin

Temp-Bin provides a quick and convenient means for saving your working files without having to open any filer directories. It also provides a safer means of discarding unwanted files than deletion. The *Temp* and *Bin* icons sit on the iconbar next to your disc-drives. You can drop files, directories and applications on them directly. Their states indicate whether or not they have anything in them.

The *Temp* and *Bin* directories can be opened by clicking on the icons with Shift or Adjust but, to save confusion, only one of them can be open at a time. They always open, or reopen, in the same screen positions, making them easy to recover should they get hidden under a window.

You may also save files in Temp from the Save boxes of applications in the same manner, and can copy or move files to Temp from the Bin directory. Drop a file on the Bin icon to discard, or bin it.

Binned files appear to be deleted but can be retrieved later if you change your mind. You may also bin files from the Temp directory in the same way. There is no danger of overwriting previously saved or binned files with more recent ones. Instead, old files in Temp are moved to the safety of the Bin and old ones in the Bin are moved into a sub-directory inside it.

As further similarly-named files are saved or binned, older ones are moved progressively down a series of sub-directories. These are named ~BIN1, ~BIN2, and so on.

The most recently saved or binned version of a file will always be found in Temp (~TEMP) or in the top level of the Bin (~BIN0), these being the directories which are opened when you click on the icons. The differences between dropping a file on Temp and dropping it on Bin are as follows:

- Temp copies the file – the original is not deleted unless Shift is pressed at the same time. This is exactly the same as dropping a file into a Filer directory window.
- Bin moves the file and date-stamps it, and the original is always deleted.

Files in both Temp and Bin are moved down exactly the same sub-directory structure and can be retrieved from it in exactly the same way. END

Disc information

The software on the cover disc has been compressed using *!ArcFS* 2 from VTi, and are opened by running a copy of *ArcFS* then double-clicking on the archive to open it. There is a copy of *!ArcFS* on each disc. Most software will run straight from the archive, but some programs may need to be copied out of the archive before being run, uncompressing them in the process. Any program that saves a file to disc, for instance, will be unable to do so into the archives on the disc.

Faulty disc?

If your disc is faulty, test whether it will verify by clicking with Menu on the floppy drive icon and choosing Verify.

If it fails to verify or is physically damaged you should return it to Acorn User, Media House, Adlington Park, Macclesfield SK10 4NP.

The *Acorn User* cover discs have been checked for viruses using *!Killer* version 3.001 from Pineapple Software.

RISC OS 4, or not

As I write this I eagerly await the arrival of my RISC OS 4 ROMs, yet by the time this issue reaches your letterbox most people should have received the most sought after upgrade since the launch of RISC OS 3. Perhaps now is the time to plumb the depths of my Boot sequence and examine all those handy little utilities and patches that I've become accustomed to over the years. Some will no doubt be included in RISC OS 4, while others will remain embedded within my Boot.tasks directory.

At the time when RISC OS limited filenames to ten characters, a number of third party utilities came out to overcome the problem. Many users question the merits of having long filenames, but any Web designer will tell you they're of great benefit and are essential when working with Java. For some time now I've had *LongFiles* by Jason Tribbeck (http://www.tribbeck.com/longfiles/) and *raFS* by Richard Atterer (http://www.informatik.tu-muenchen.de/~atterer/riscos.html) installed on my machine.

RISC OS 4 now includes long filename support as standard, but if you have an older machine these remain invaluable.

Longfiles is perhaps the least obtrusive, in that it simply merges with the Filer itself and works, seemingly invisibly, to provide long filenames. In actual fact it's hiding a secret file in each directory which contains the real name of the file and then patches the Filer display so that long filenames are displayed.

The only give away occurs if you accidentally prevent *Longfiles* from running – in which case you immediately see all your long files with strange truncated names. It does work well though and I've found it very reliable. *raFS* works in a slightly different way, in that it stores all it's files in a special directory and installs its own icon on the bar. Under normal circumstances you wouldn't see it's hidden files, and again, it integrates seamlessly with the rest of the desktop.

Because everything is self-contained in its own *raFS* directory it's easy to manage your files. This makes it ideal for storing local copies of Web pages and development work.

Spectrum

According to the Help file *Spectrum* is a simple spectrum analyser for 16-bit sound systems, or in English, a snazzy looking graphical display for Risc PC sound output. Written by James Reynolds, and available to download from http://www.argonet.co.uk/users/j-rays/ it was designed originally to solve James' annoyance at watching PCs being able to play MP3s and have a graphical analyser on screen.

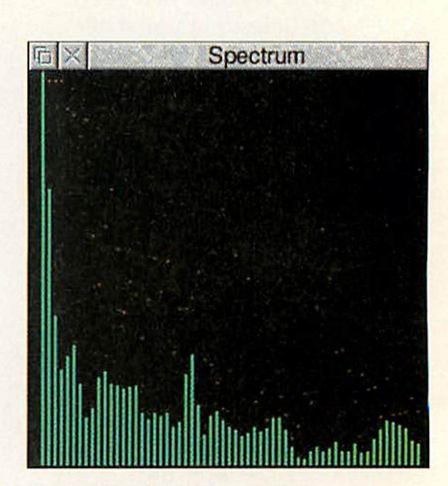


It's certainly very colourful and my personal favourite. The thing I like about it is the fact it's completely stand-alone.

Just load it up and instantly any sound coming from the Risc PC's internal sound system triggers the frequency bars.

What's more, it's customisable and James even provides documentation for programmers to write their own plug-in effects – in a similar vein to the excellent screen saver Delirium, mentioned in previous columns.

A second effect, Fire, is provided within the initial download and a third effect; Drip is nearing completion. Spectrum makes an ideal graphical accompaniment to any of the MP3 players featured in last month's column, including the multitude of other sound players.





ISIS

Isis is a spreadsheet and although as I write this, it's in early stages, it certainly looks as if it has the makings of a very nice application indeed. By the time you read this *Isis* may have transformed itself into a new version, but I've looked at the initial Request-For-Comments (RFC) version.

Isis is written by Nicholas Marriott, whose original intention was to write a powerful spreadsheet which would be ideal for home and educational use, yet still contain many of the features found in more powerful commercial spreadsheets.

It is extremely easy to use, which should make it ideal for novice users or for schools who wish to explain the theory and use of spreadsheets.

It contains an uncluttered yet comprehensive user interface including the ability to colour specific cells, or to change the font style of text. Individual or grouped cells can be selected and a style or border operation applied to them.

Column widths and row heights are all fully definable as are font sizes, decimal places and text justification, so it's very easy to change the overall look of the finished document.

You can even drop sprites or drawfiles into a cell so graphics can be incorporated into the finished output. At first glance you may be mistaken for thinking that *Isis* is a basic package, it isn't – it includes a formula processor which uses the standard C model. Although this might

Isis: 'Yet Another Calculation Example'

Name	Mark	Grade
Christopher	15	=[2,2]<6?"D":([2,2]<11?"C":([2,2]<16?"B":"A"))
Diane	14	B
Fred	9	C
George	4	D
James	18	A
Jennifer	5	D
Louise	4	D
Martin	12	B
Philip	10	C
Rachel	17	A
Samuel	13	B
Sarah	7	C
Sharon	11	B
Average	11	B

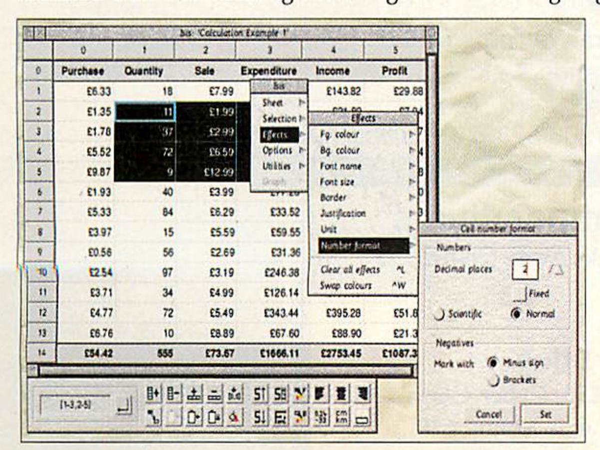
not mean a lot to the average user, it means you can use a comprehensive set of formula operators.

Functions such as addition, subtraction and other arithmetical operators can be applied to cells in addition to conditional statements, allowing you to build up quite complex operations. Indeed this opens up the facility for teachers to design worksheets and mathematical puzzles for pupils to experiment with.

In the sample screen shot you can see a simple mathematical game (supplied with *Isis*, along with several other example files) in which two numbers can be entered. *Isis* will then tell you whether they are odd or even and place them in order of size.

The formula for calculating the smaller of the two numbers is shown. By carefully designing a layout teachers, for example, could get *Isis* to automatically calculate grading tables for pupils. In the example below, *Isis* has automatically calculated the grade, via a formula, based on their marks. This will be excellent for teachers or anyone who wants to perform reasonably complex calulations without having to resort to cumbersome applications like *Excel*. This is thoroughly recommended – and by the time you read this, it's likely to have been enhanced even more.

(http://www.alphapro.demon.co.uk/)



In brief

CoolSwtch

For those of you like me who always seem to have the desktop cluttered with all manner of open windows and applications running, *CoolSwtch* can be pretty useful. It provides a simple and quick way of toggling between different windows which can often obscure each other.

By utilitising the Control+Tab combination (which Windows users will be familiar with for swapping between tasks), a small menu will pop up in the middle of the screen in order for you to toggle through the available windows. When you let go, the relevant one will magically pop to the front – ideal if you've covered it up with fifteen other windows! *CoolSwtch* can be found on this month's cover disc.

OpenFiles

Another excellent little application, this time written by Dave Thomas (http://www.sliced.demon.co.uk/software.html), incorporates itself into the desktop so that a single key combination – this time Control+O – will activate it and pop up a very useful list of all open files, giving you the option to either close them individually, or to close them all.

Again, brilliant if an application crashes without closing all of its files, or if, like me, you tend to debug software with numerous files left open. I'm not sure if something like this will be in RISC OS 4 but if not, I hope it will remain compatible so that I can incorporate it back into my new Boot sequence.

Contacting AU

You can contact the PD page by writing to me, Paul Vigay, at Acorn User, Tau Press, Media House, Adlington Park, Macclesfield, SK10 4NP.

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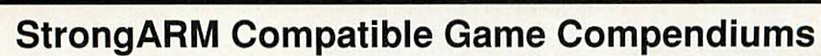


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Business futures

Until now I have kept fairly quiet about the future of Acorns. Not the company Acorn – that is long gone, but about the future use of Acorns, especially in a business context. As far as I can see the battle to keep Acorns alive in the education sector is in the final stages – some pockets of resistance, a few hardliners, but generally the PC has won.

The unfortunate thing is that it has not won because PCs are better but because they are seen as the mythical 'industry standard'.

As I have said before; industry does not have standards, it has habits. It is rather like the story of the two officers in the Royal Navy wardroom discussing traditions. One is a visiting RAF officer who starts to tell the RN officer of the traditions in the RAF, to which the Naval officer replies: "My dear Sir, the Navy has traditions, the RAF merely has habits".

Of course the sheer ubiquity of the PC may lead to its eventual downfall and some industrial analysts are now talking about the post-PC period. In other words we may have passed the peak of PC penetration.

But what of RISC OS machines as we now enter the Amiga/Atari stage of their careers? Do they have a future? To answer that question we need to examine what defines a computer system.

We obviously need hardware, an operating system and software. New hardware is here and we can still get a reasonable amount of serviceable and desirable older hardware. The Risc PC was so far ahead of its time that other manufacturers are still playing catch up. That being said the future lies with the new stuff, not because it should be better but because the whole scene needs new blood. We need new people buying the machines and not just those who are already converted. If that doesn't happen we will have a constantly shrinking customer base. Not good.

So, to the second need: an operating system. RISC OS is so good we take it for granted, at least until we use a PC and realise how bad that is.

However, RISC OS was in great danger of being left behind as other operating systems were catching up and overtaking it. It is not just the user interface, important though that is. The operating system gives you the ability to support other hardware and plug-ins and of course software. The initial verdict on RISC OS 4 is very good – they have even managed to improve *Printers*, something they said we would have to wait for.

Cerilica Vantage: the next killer app?

That brings us nicely to our third need: software. This is, in my opinion, the base of the triangle upon which sits the hardware and OS. Without this it makes no difference how good the other two are.

Nobody really cared about the early development and emergence of the personal computer until there was a killer application that everyone could see and benefit from. One of the first killer apps was *VisiCalc*, the first spreadsheet for the PC. Once people saw a spreadsheet they had to have the computer on which it ran, and the rest, as they say, is history. Again, much of the software around for Acorns is good but some of it is showing its age. Where is our killer app?

At one time it was *Impression* and a case could be made for *Sibelius* but it's been a long time since a software release for our platform made anyone who did not own an Acorn immediately decide to go out and buy one: the next one should be Cerilica's *Vantage*.

This is particularly the case in the business use of Acorns. So, is there a future? Yes, of course, is the answer, but it will be difficult without that killer app. So what killer app do you see the need and the market for? E-mail me (Mike Tomkinson at bizniz@acornuser.com) and we can compile a list of must-haves for RISC OS.

Bug-bomb users

The *Millennium Bug Toolkit* which I reviewed back in the July issue has been adopted by the BBC to ensure Y2K compliance of their PCs. That involves the staggering figure of approximately 25,000 PCs worldwide.

I have also had it confirmed that National Cash Registers (NCR) is rolling it out onto their EPOS (Electronic Point Of Sale) systems and that Scottish Nuclear Power are using it in their nuclear power stations, which says a great deal for the confidence people have in it.

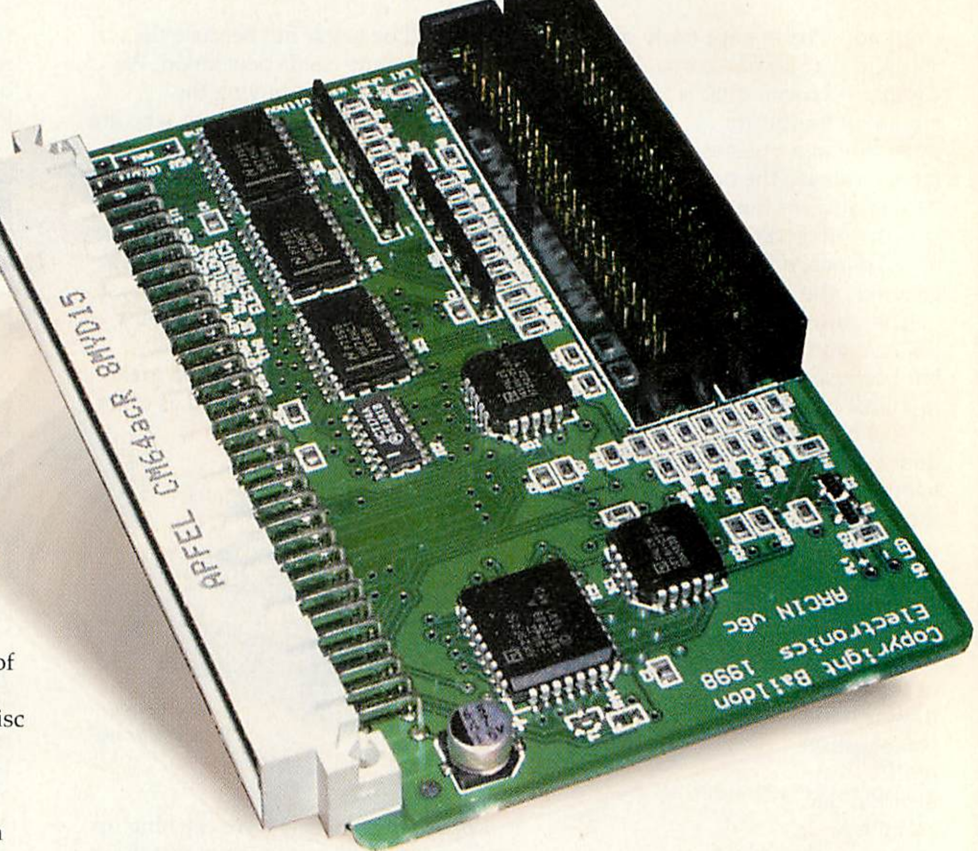
Acorn systems should not be affected but at least we should be able to watch the Beeb, go shopping, and not worry about Chernobyl-type melt-downs as the Millennium celebrations take place.

If you do have access to PC-based systems which have not been checked for compliance you only have a few months left and I strongly recommend the Toolkit.

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Storage pro

Don Slaven finds a use for those old harddiscs



Over the years the 2Gb harddisc on my Risc PC has served me quite well, provided that I remembered to delete any old or unwanted files. Like many folk with inadequate backup facilities I had to decide which of the data files might be useful in the future and save them to floppies.

While this seemed like a good idea at the time, the importance of keeping more than just those files which *I* thought important was driven home by a recent request to provide a copy of a file I had long ago discarded.

A major and painstaking task, when presented with drawers full of diskettes, is the cataloguing and maintenance of the files. Just one disc misplaced or incorrectly labelled means hours of hunting to find the archived file.

One other and very real problem is that the graphics files I produce can be quite large; 35Mb is not uncommon. Normally a file of this size has to be spread across several floppies. Obviously if one is lost, the whole image is useless.

My other machine, an ancient A3000, does not have any storage facilities other than the floppy disc drive it came with.

Although now considered outdated, this machine could be given a new lease of life by bringing it into use for the word processing and DTP needs of other members of the family, thus increasing the time available on the Risc PC for me.

I do have an old SCSI card which could be used to support an external harddisc, but when installed it sticks out of the back of the machine. Not such a good idea when the unit is continually moved from one location to another.

The answer to both my problems is to invest in a larger harddisc, a backup data storage system for the Risc PC and a small internal device for the A3000.

Now that harddisc storage costs have fallen, there is really no reason why those of us with insufficient disc space should not invest in a backup drive. However selecting the right product isn't easy.

Should one go for a SCSI drive? Tempting, if you have a SCSI card fitted. However, you will probably find that these are a tad more expensive than a similar-sized IDE harddisc.

Zip, Jaz, Syquest and other removable devices are also an attractive option but here too there is a problem. The largest reasonably priced device in this range of units is about 2Gb. Although this may seem a good size to most of us, there are some users who need a whole lot more. My problem is not only how to increase my internal drive capacity, but how to supplement this with adequate backup storage.

Increasing the size of the main drives is not really too difficult a task, just pop in another larger drive. However, I would also like to increase the speed of drive access, which would alleviate some of the niggling delays when working on large files with applications, such as *Photodesk*, which can use the harddisc as virtual memory.

APDL seem to have provided an answer to this predicament. They are marketing a fast IDE interface which, when installed, provides access to the stored information at approximately twice the speed of ADFS.

The ideA interface is also self-configuring, so there is no need to spend enormous ages fiddling about to get it working. Two forms of the

blems solved

interface are available. The A3IN is intended for the A3000, A3010, A3020 and A4000 machines, while the ARCIN has been designed for the A310, A400 series, A540, A5000, A7000 and Risc PC range of computers.

Both interfaces are supplied as boards which plug into the extension socket on the main computer board, external podule socket or backplane, depending on which computer you have.

Installing the interface in the Risc PC is easy. Just lift off the lid, locate the backplane and insert the card into the lower socket. Fitting additional harddiscs is relatively simple. Just follow the easy-to-understand user manual and installation guide. If you are wary of messing about inside your machine, then for a small fee APDL or your local dealer will fit the board for you.

After fitting all the hardware and closing the computer lid, I switched on and immediately saw that I had an extra accessible harddisc.

To improve the efficiency of storage, I then planned to partition the 8.2Mb drive into more manageable chunks. Using the software provided, the single physical drive – that is the harddisc unit you have just installed – can be made to appear to the filing system as a number of drives, known as logical drives.

Dividing the drive into several smaller logical drives decreases the size of the Large File Allocation Unit, (LFAU) and increases the efficiency of storage.

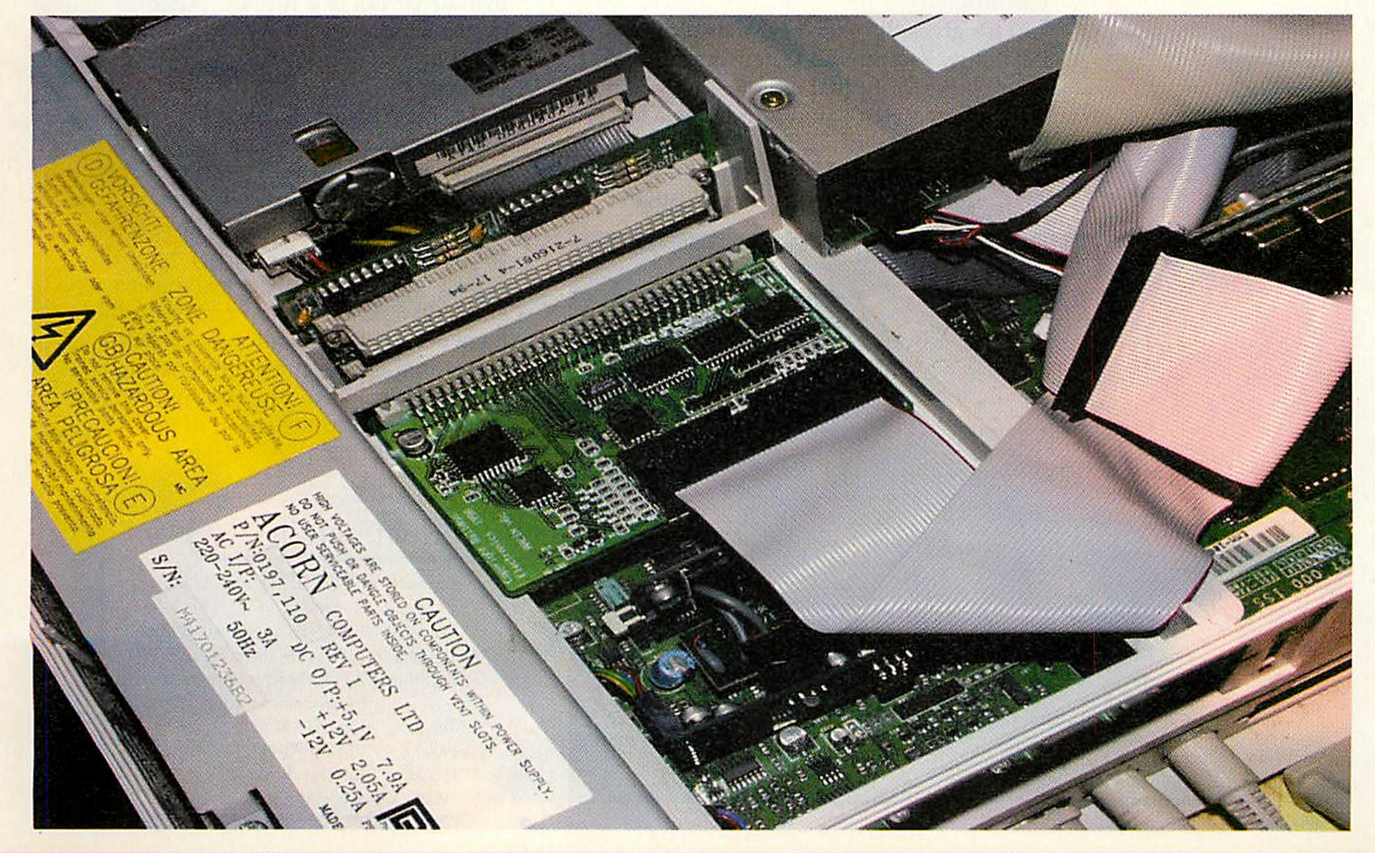
Very simply put, the LFAU can be described as the smallest available storage unit on the harddisc. The larger the logical drive, the bigger it gets. As an example: the smallest LFAU is 512 bytes – on very small drives – for drives up to 499Mb the LFAU is 1Kb.

Doubling the drive size doubles the LFAU, so drives over 499Mb have an allocation unit of 2Kb, at 998Mb the LFAU rises to 4Kb. While on the 8Gb drive I have, the smallest storage area available is a massive 32Kb.

Under this system, a file of only 5Kb in size would be stored in an area of 32Kb wasting 27Kb of space. That's why I partitioned the drive into three logical drives.

The first is destined to hold mainly text files: I allocated 2Gb for this partition. The second is for graphics files and other large files. The third partition now holds the two PC partition files for the PC Card and takes up the remaining 4Gb of space on the harddisc. *(For an in-depth look at partitioning harddiscs see Simon Anthony's article on page 54.)*

The interface supplied by APDL supports up to four devices, whether they be CD-ROMs or harddiscs. With the ability to create up to eight partitions, large drives are now available for use by pre-RISC OS 3.6 machines. With four physical harddiscs installed, this could lead to



Free space on Data1

Free	147M Bytes	
Used	1916M Bytes	
Size	2063M Bytes	

Free space on Data2

Free	542M Bytes	
Used	1458M Bytes	
Size	2000M Bytes	

Free space on PCDiscs

Free	945M Bytes	
Used	3055M Bytes	
Size	4000M Bytes	

Free space on Harddisc4

Free	993M Bytes	
Used	228M Bytes	
Size	1221M Bytes	

Free space on BUData1

Free	2149M Bytes	
Used	256K Bytes	
Size	2149M Bytes	

Free space on BUData2

Free	941M Bytes	
Used	1059M Bytes	
Size	2000M Bytes	

Free space on BUData3

Free	92M Bytes	
Used	1908M Bytes	
Size	2000M Bytes	

:0 Data1 Data2 PCDiscs Harddisc4 :0 BUData1 BUData2 BUData3 Apps 43816

The addition of just one internal harddisc in additon to the original drive, allowed me to create three logical drives using APDL's software. This puts four harddisc icons on my iconbar. The back up DataSafe storage device was also partitioned to give more flexibility. As can be seen by the 'Free space' dialogue boxes, I now have plenty of working and back-up storage space. BUData3 now holds an image of my PC cards 'C' drive. Now if I have a problem with the Windows operating system, I can delete the offending 'C' drive from it's permanent location on PCDiscs and replace it with the back-up. No more interminable Windows installations!

the appearance of an incredible 32 working logical harddisc icons on your iconbar! Perish the thought, but it could be done.

APDL also seem to have got over the problem of restricted backup data facilities. The DataSafe backup system is designed to be used with the parallel printer port on an Acorn machine.

It consists of an external case for a 3 inch IDE harddisc plus cables and software to connect to your Acorn. The system is provided either with or without a fitted harddisc.

This gives the user a great deal of flexibility. You can buy a new harddisc of your choice, or fit that old one that you put somewhere when you upgraded to a larger capacity internal drive.

The box provided for review holds a 6Gb Acorn-formatted IDE drive – more than adequate for the majority of data backup purposes. There are two versions of the system on offer at present: DataSafe Standard and DataSafe Super.

With the Standard model (the one under review), the drive is screwed into the case, but the Super has a drawer unit for easy insertion and removal of drives.

This provides unlimited backup storage space at very reasonable cost. When one harddisc is full, just replace it with another. The drawer unit can also be fitted into the 5 inch drive slot of a Risc PC. After using both systems for at least two months, I can say that I have had no real problems with either of them.

I also noticed a decrease in disc access time when using the Aleph1 PC card, which makes the PC side faster and more usable. For those with limited storage capacity but with a limited purse, APDL have come up trumps.

Using relatively inexpensive hardware and software, those old harddiscs which have been sitting about waiting for something to do can be brought into use, and APDL can also provide you with the means to beef up the speed of your internal harddisc. **END**



The datasafe box

Product details

Product:	APDL IDEFS and APDL Datasafe
Price:	IDEFS £52: Datasafe Box only £104 with 3.3Gb drive £199
Supplier:	APDL 39 Knighton Park Road, Sydenham, London SE26 5RN
Tel:	0181 778 2659
Fax:	0181 488 0487
E-mail:	info@apdl.co.uk
Web:	www.apdl.co.uk

Looking for a flat?

Chris Drage looks at the benefits of Flat Panel Displays

Monitors are crucial to any computer system as they enable the end user to interact with the machine. The importance of the monitor can never be underestimated, but with so many products of various sizes how do we know what constitutes a good monitor? Enter FPDs or Flat Panel Displays.

A monitor is an accepted part of the computer kit these days. What becomes obvious, often too late, is that monitors differ vastly in quality. That good deal you got on the monitor that came with your computer might quickly become, quite literally, an eyesore. To a degree, display clarity has to do with individual differences in eyesight, but it has much more to do with what people use the computer for and what they're willing to accept.

CRT monitors

The cathode-ray tube (CRT) monitor, is the oldest type of display and still the most common. The CRT is essentially a vacuum tube whose face, the glass front, is coated internally with phosphor compounds. A cathode shoots negatively charged electrons toward the face of the tube where they collide with the phosphor coating. This coating converts the enormous energy of the electrons into light, creating the image you see on your screen.

Deflection Yoke
Aluminised Phosphor
Electron Gun
Glass Bottle

Figure I - A simplified view of how CRTs work

The electron guns are one of the four main elements that determine the quality of the image. The others are the shadow mask (replaced in some monitors by an aperture grill), the phosphors that make up the coating on the face of the tube, and the face itself.

In general, colour CRTs have three electron guns arranged in a triangular pattern. Each gun projects a beam of electrons at a three-dot or three-stripe pattern on the face. If left on their own the electrons would all just hit the centre of the display, so the CRT uses electromagnets around the edge of the tube, forcing the beam to scan across the display, thus building a picture. At a resolution of 1024x768, for instance, each scan line contains 1024 pixels, and there are 768 lines that must be drawn each time by the electron guns. When the beam reaches the end of one line, it moves quickly to the beginning of the next.

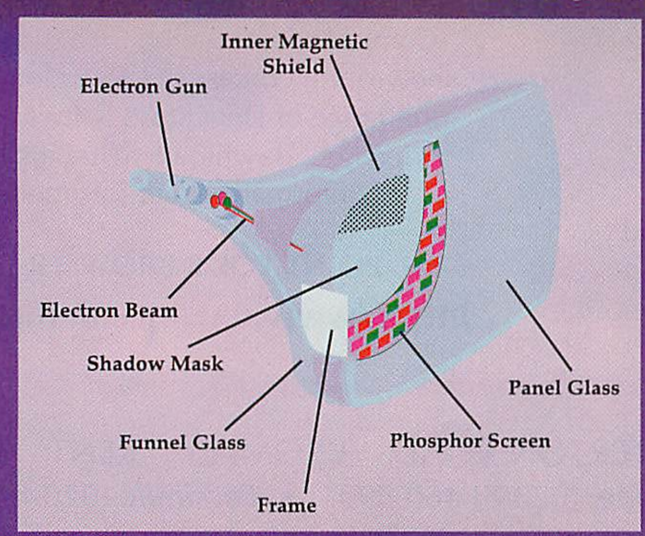
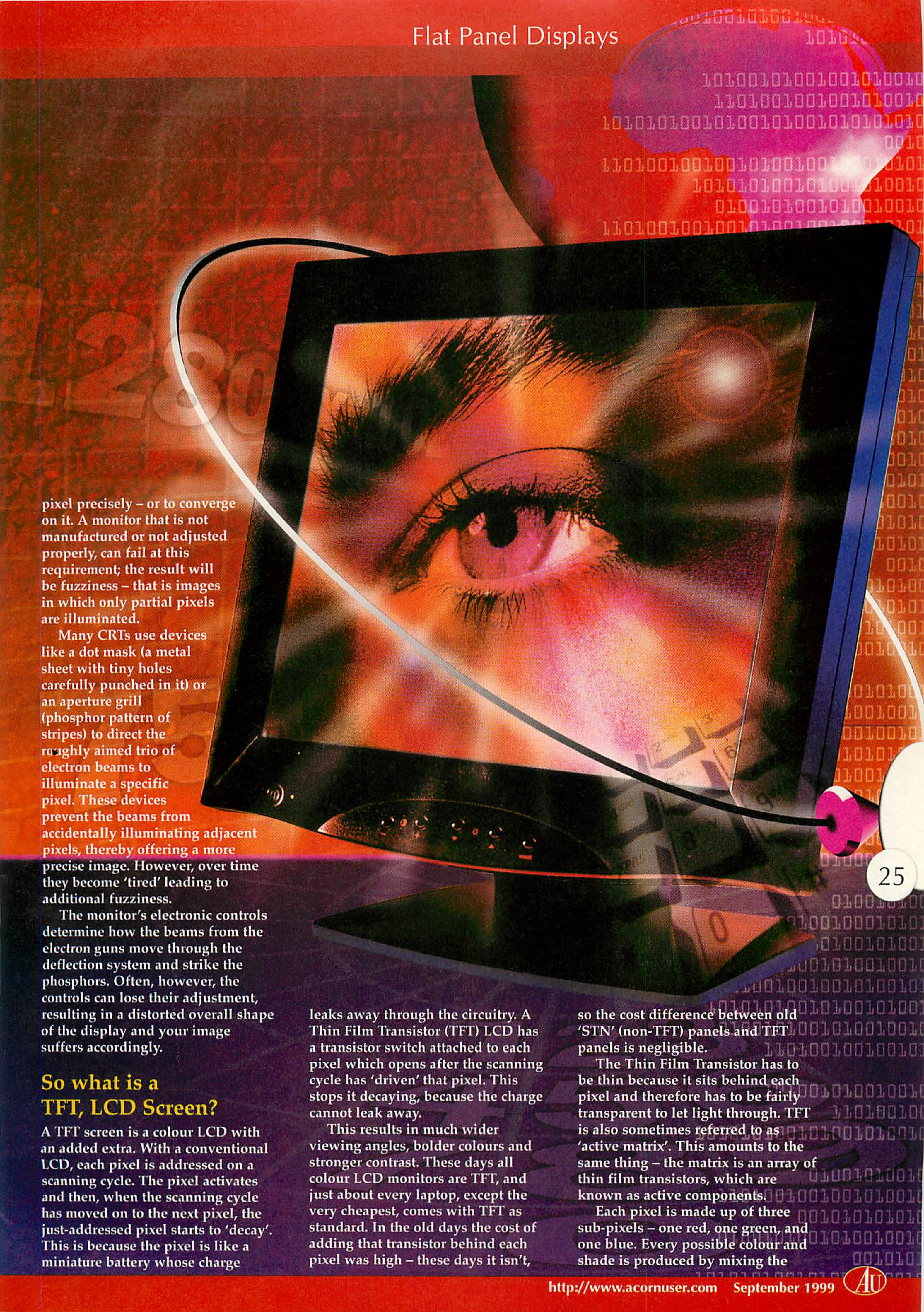


Figure II - The internals of a CRT monitor

When the electrons hit the phosphor compound, it glows. This glow, which happens for varying lengths of time and in different colour patterns, is essentially what you're seeing when you look at your monitor. The glow appears in different colours because a colour CRT contains not one, but three separate phosphor compounds.

One of the most annoying and headache-inducing features of CRT monitors is flicker. The two factors involved in flicker are phosphor persistence and refresh rate. The electron beam paints the image to the screen at a rate of at least 60 times per second, it's important that the phosphors persist (or keep glowing) long enough to bridge the gap between these paintings. If they don't, you get flicker.

But flicker is not the only factor that can undermine the quality of a display. Another is convergence, whose name arises from the need for the trio of electron beams to hit each



pixel precisely – or to converge on it. A monitor that is not manufactured or not adjusted properly, can fail at this requirement; the result will be fuzziness – that is images in which only partial pixels are illuminated.

Many CRTs use devices like a dot mask (a metal sheet with tiny holes carefully punched in it) or an aperture grill (phosphor pattern of stripes) to direct the roughly aimed trio of electron beams to illuminate a specific pixel. These devices prevent the beams from accidentally illuminating adjacent pixels, thereby offering a more precise image. However, over time they become 'tired' leading to additional fuzziness.

The monitor's electronic controls determine how the beams from the electron guns move through the deflection system and strike the phosphors. Often, however, the controls can lose their adjustment, resulting in a distorted overall shape of the display and your image suffers accordingly.

So what is a TFT, LCD Screen?

A TFT screen is a colour LCD with an added extra. With a conventional LCD, each pixel is addressed on a scanning cycle. The pixel activates and then, when the scanning cycle has moved on to the next pixel, the just-addressed pixel starts to 'decay'. This is because the pixel is like a miniature battery whose charge leaks away through the circuitry. A Thin Film Transistor (TFT) LCD has a transistor switch attached to each pixel which opens after the scanning cycle has 'driven' that pixel. This stops it decaying, because the charge cannot leak away.

This results in much wider viewing angles, bolder colours and stronger contrast. These days all colour LCD monitors are TFT, and just about every laptop, except the very cheapest, comes with TFT as standard. In the old days the cost of adding that transistor behind each pixel was high – these days it isn't, so the cost difference between old 'STN' (non-TFT) panels and TFT panels is negligible.

The Thin Film Transistor has to be thin because it sits behind each pixel and therefore has to be fairly transparent to let light through. TFT is also sometimes referred to as 'active matrix'. This amounts to the same thing – the matrix is an array of thin film transistors, which are known as active components.

Each pixel is made up of three sub-pixels – one red, one green, and one blue. Every possible colour and shade is produced by mixing the

In TFT displays there are thousands of translucent coloured dots behind a glass (5) screen. Each pixel is made up from three dots (4) – one red, one green, one blue. Behind the dots is a light (1) which when shone through each of the dots, would produce a clear white screen.

We therefore need some way of stopping the light to create black and coloured dots. This is achieved using special polarised crystals (2). By sending an electrical current through the crystals it is possible to block the light, and produce a variation in colour. Each of the red, green and blue pixels can have different amounts of light passing through them, thus providing mixed shades of different colours on screen.

TFT screens improve this process by adding tiny transistors to each pixel (3). A transistor takes electrical current and holds it. In display terms this means the polarisation, and therefore the colour on-screen, won't change until the electrical current is removed.

three in varying strengths. Just so you know, the pixel is like a light valve – the light comes from behind and is 'modulated' by the light valve. Turning a red pixel on allows white light to come through, which is then filtered red by an array of colour filters printed on the inside of the LCD cell.

In a monitor like the one you probably have, there are 2,359,296 sub-pixels and one tiny transistor for each. That's why manufacturers say that a few failed pixels does not constitute a serious defect!

Very little research has actually been conducted on the CRT vs LCD debate. However, one piece of research does exist conducted by a team comprising: Pringle Brandon, Allen Stewart partnership, YRM Engineers Ltd, and D.P. Robathan IT Consultant. A summary of their findings is outlined below and bears out many of the comments from users:

- The desire for large screens to display to large groups has led to large monitor footprints on desks and less distance from screen to face – often much less than the EU-advised 600mm.
- The same screen real-estate is provided by TFTs on a smaller footprint than CRT displays.
- TFTs provide enhanced ergonomics and more options for users.
- The locations of screens are no longer dictated by the monitor size.
- With TFT monitors power consumption is much reduced – about 30% per head. This also saves on primary and alternative supplies, generator, UPS and switchgear. The need for network room cooling is largely dispensed with, thus lowering running costs for schools. Cooling requirement goes down by about 20% per head.
- CRT monitors are complicated and costly while TFTs are only (currently) expensive at initial purchase.
- CRTs with large curved screens are highly sensitive to reflections and glare: thus lighting has become critical; this is not the case with TFTs. TFTs are found to out-perform any equivalent CRT screen.
- Large monitors and desks are difficult to install and rearrange. This is not an issue with TFT monitors.
- TFTs have less microwave emissions, thus making them safer to use.



The benefits

There can be no doubt as to the improvements that FPDs bring. Obviously the space saving is a major benefit and there are definitely savings in pure power consumption. Whereas a CRT monitor consumes between 80W and 150W (150W for a typical 17in), a TFT monitor would typically use around 40W (the Apple Studio Display draws under 35W). When too many CRT monitors are used at once, as in a large network, they can even disturb the main supply of electricity in a building.

TFT monitors have changed a great deal over the past two years. Qualitatively they have improved significantly. Although no definitive research has been undertaken into the general benefit to health from using FPDs, there are, according to my survey of TFT screen users, considerable benefits. The main problem with CRT monitors appears to be flicker, and TFT screens do not flicker.

The flatness, the luminance and brightness of a TFT screen is certainly an advantage when it comes to room lighting. This is often poor and may suffer from ambient lighting from sources such as windows. The TFT screen reflects less and performs better under these conditions.

A TFT screen is approximately

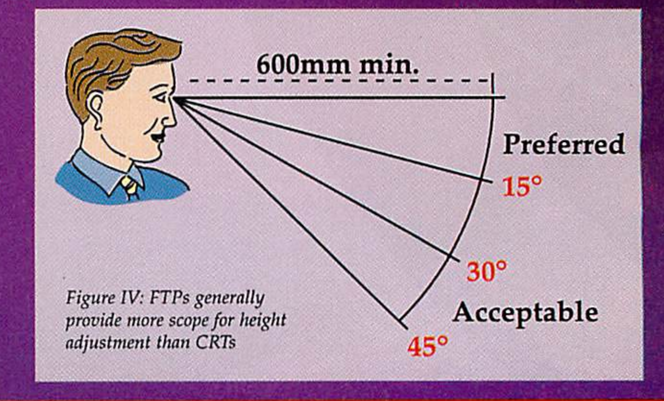


Figure IV: FTPs generally provide more scope for height adjustment than CRTs

Flat Panel size	CRT size	Typical resolution
13.5in	15in	800 x 600
14.5in to 15in	17in	1024 x 768
18in	21in	1280 x 1024 or 1600 x 1200

Table 1: FPDs offer the same viewable area in a smaller package

one to one and a half times as bright as an equivalent CRT monitor. The problem is there can be no direct comparison as the two technologies are so different. On the whole, TFT screens appear much brighter. CRT monitors typically give out a low level of X-rays and radiation and although manufacturers will dispute this, there is still some concern that this is harmful to health.

Although there might not be any immediate harm, no one is quite sure of the long term effects. Similarly, the emission of static electricity from a CRT screen can be quite considerable. A TFT screen neither holds static charge nor emits radiation.

At the lower end of the FPD market there is a trade-off with quality. Typically, with poorly designed housings, restricted screen modes and low quality of display, their value is questionable to say the least. It's certainly best to spend more to obtain quality. In the long-term, the maintenance of TFT screens is more cost-effective.

The most likely item to fail is the tube which provides the back lighting, but typically these should give three to five years of use – more like five years of constant use – so there's a long period of time when the monitor will be performing at hundred percent before it drops off to a fifty per cent level. You might be spending two to three times as much as on an equivalent CRT monitor, but the FPD is likely to outlast the CRT by many years.

When comparing prices between CRT monitors and equivalent FPDs, keep in mind that the size of a CRT display is always larger than the equivalent TFT screen. The measurement of an LCD screen relates to the actual dimension pixel to pixel, not the overall size of the screen as is the case with CRT monitors. With CRT monitors the measurement relates to the whole of the front of the glass tube some of which, around the edge, is not used but is still included.

LCD screens give a proper flat screen image. Although CRT monitors have clever electronics to overcome the effects of screen curvature the image is still distorted. The larger the screen the greater the curvature needed to compensate for the increased vacuum inside. The electronics provided for image correction can drift over a period of time as the tube degrades. TFT screens on the other hand don't suffer from this problem whatsoever, over any period of time, and are always pixel-accurate.

FPDs also have improved viewing characteristics. Ask any person using one all day and s/he will have little, if any, eye strain, a lack of headaches and other related ailments.

These benefits also extend to the ergonomics of the screen. Due to their size and design FPDs can be easily adjusted to suit a users needs. Apple's Studio Display for instance has 8cm of vertical travel, allowing you to obtain the perfect screen height, no matter how low or high your desk is. It can also be hung from a wall; a very flexible product indeed.

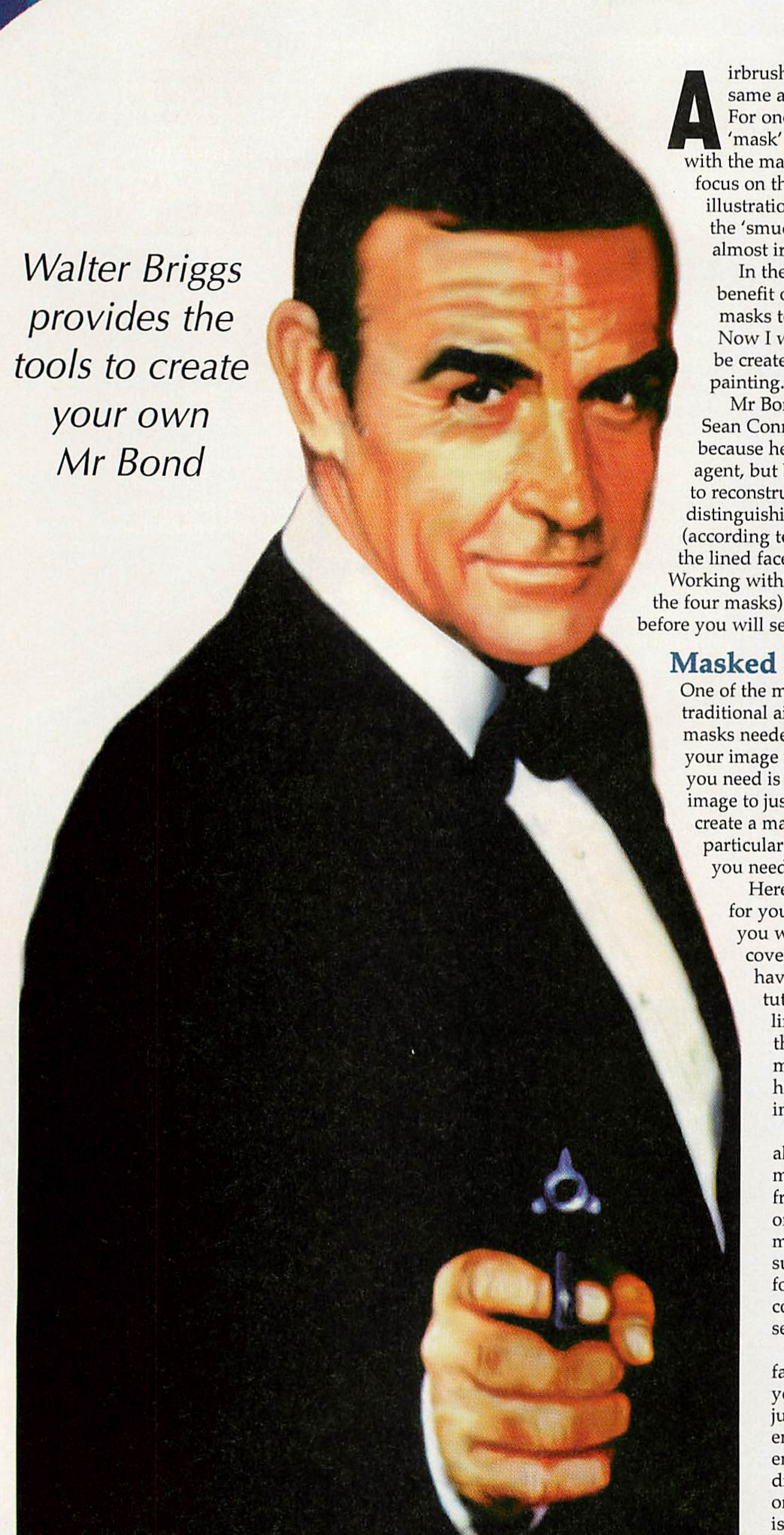
While the Studio Display is fairly unique in these features, FPDs by their very size and weight offer more ergonomic options than traditional CRTs. While reviewing the Apple monitor for instance I was able to position my seat at a height most comfortable to me, and then adjust the screen to fit. Now I'm back to using a CRT I've had to lower my seat to suit the monitor height; something I'm not too happy about.

I conducted my own 'spot' survey in two institutions: in an office of an IT company and in the office at my college. In the former case the staff had been using FPDs for some time while at the college the office staff continue to use the CRT monitors which came with their computers two years ago. The college staff complained of eye strain and recurring headaches and put these down to extended use of the computers. They welcomed the chance to try anything which would help alleviate these symptoms.

In the office of the IT company on the other hand, there was a noticeable lack of flicker when you entered the workplace. There were approximately thirty FPDs in use, mostly 15in (desktop) size. I asked some of the staff about the transition to FPDs and the effect on them. The majority reported having none of the headaches, eye strain or tiredness they experienced with their original CRT monitors and one worker made a special point of showing me her glasses which now 'live' more on her desk top than on her nose! The vote for FPDs was overwhelming.

Join me next month when I'll be comparing five flat panel displays from Iiyama, Apple, Trident, Mitsubishi and Silicon Graphics. END





Walter Briggs provides the tools to create your own Mr Bond

Airbrushing with a computer is not quite the same as working with the traditional tool. For one thing the creation of the vital 'mask' is so much easier, simply clicking with the magic wand. Though this article will focus on the creation of an electronic airbrush illustration, on occasion the temptation to use the 'smudge brush' becomes so great as to be almost irresistible,

In the last two issues I have shown the benefit of having the use of layers and masks to create and compile an illustration. Now I want to show how such imagery can be created – how to produce a digital painting.

Mr Bond, of movie fame, in the form of Sean Connery is the character chosen, not because he is seen as the epitome of the secret agent, but because of his distinctive, and easy to reconstruct features. He has such a distinguishing smile, and such an enigmatic (according to women) countenance, that even the lined face in mask format is recognisable. Working within the four tones (corresponding to the four masks) mentioned earlier, it won't be long before you will see that Connery look emerging.

Masked steps

One of the most time-consuming features of traditional airbrushing is the creation of the masks needed to protect the different sections of your image while you work. With a computer all you need is a drawing, painting or similar image to just click on with the magic wand and create a mask within the boundaries of a particular colour range – though of course you need the image in the first place.

Here all the preliminary work is done for you with the masks on disc. Hopefully you will find the set of four masks on the cover disc, and be in a position, and have the inclination, to join in the tutorial. The fact that the article is limited to four pages, and includes the images, means the instructions may be a little brief in places, but hopefully you will have enough information to participate.

If you have an art package that allows multiple masks, drop the 8-bit masks onto a page and determine from the options what size the mask is on your program. You can scale the mask to suit your canvas, just make sure you use the same measurements for all four. Figure I shows the various colours applied to the separate mask sections of Mr Bond's face.

The colours that I used for each facial tone are listed below – though you can choose values of your own, just make sure that they are light enough to easily over-paint, yet still enable you to distinguish the different areas. Another thing to do once the initial tones have been filled is to blend the whole canvas, just to soften the edges where the colours

Licence to paint

meet; this will allow for easier coverage. The colour values are in RGB format, and are those shown in Figure I.

Lightest tone and black, are both included on the same mask.

	Red	Green	Blue
Light tone	35.1	88.6	70.2
Mid tone	94.9	61.6	42.7
Dark tone	89.0	43.5	30.2
Darkest tone	72.2	32.5	27.2

Besides white and black these were the main colours used throughout the painting. Even in some of the lightest places the darkest tone was used most. With the airbrush set very low the colour can be built up very gradually, almost imperceptibly.

One of the most important things to remember is you will almost certainly have to work on your mask-channel(s) separately. I am airbrushing with my favourite program – *Studio24*, so the terms will be with reference to that package, but I will endeavour to keep the commentary generic to all other packages with similar features.

So, the screen-shot. Figure II shows the menu needed to work on the mask-channel in *Studio24*. Here the mask appears red, although

Figure I

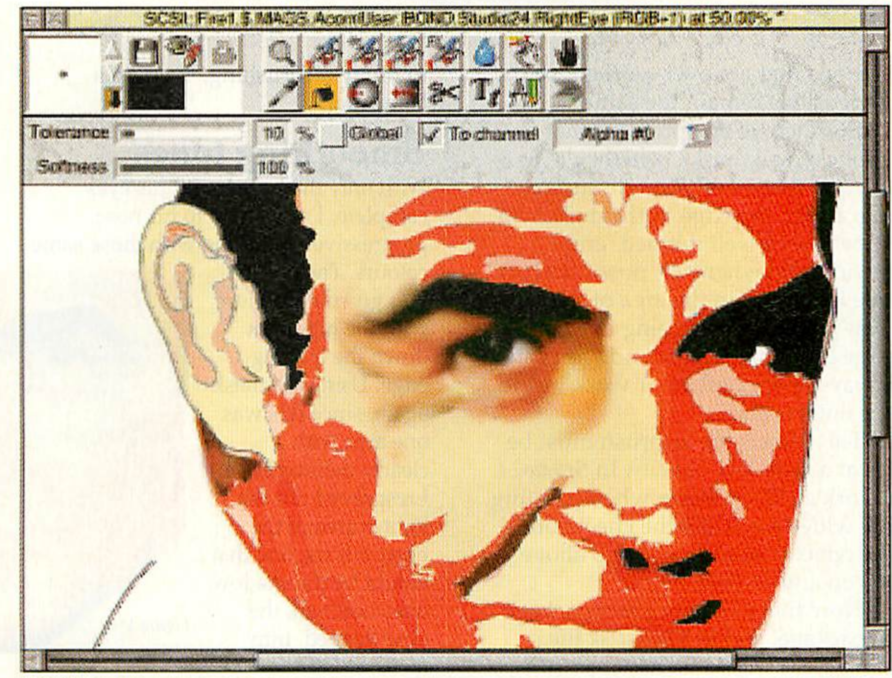


Figure II

mask colours will no doubt vary in different packages. The face area has been filled with a mask where the tolerance has been set at 10%, so it has filled the section that holds both the mid, and dark tones. Don't make the mistake of having too strong a contrast between the neighbouring colours where there is no well-defined edge, otherwise blending the colours along that line can be difficult.

Where the masks are 8-bit, the edges will be soft, anti-aliased; whereas a 1-bit mask will leave a very stepped edge.

If your package only uses 1-bit masks try leaving any blending or softening of the edges till that particular section is finished, since re-using the mask (a common occurrence) will produce that stepped edge again.

Though I work in a particular way, it's not the 'right' way, or necessarily the 'best' way; so work as you like, this article is just to demonstrate what can be achieved, and the methods that can be used to accomplish that feat.

Eye-eye Commander Bond

Figure II also shows the initial work on the right eye of 007, and from there you will see that the work progresses out, and round from this feature.

The detailed masks have already given the portrait the distinctive features of Sean, and it's important to use the masks to correct any

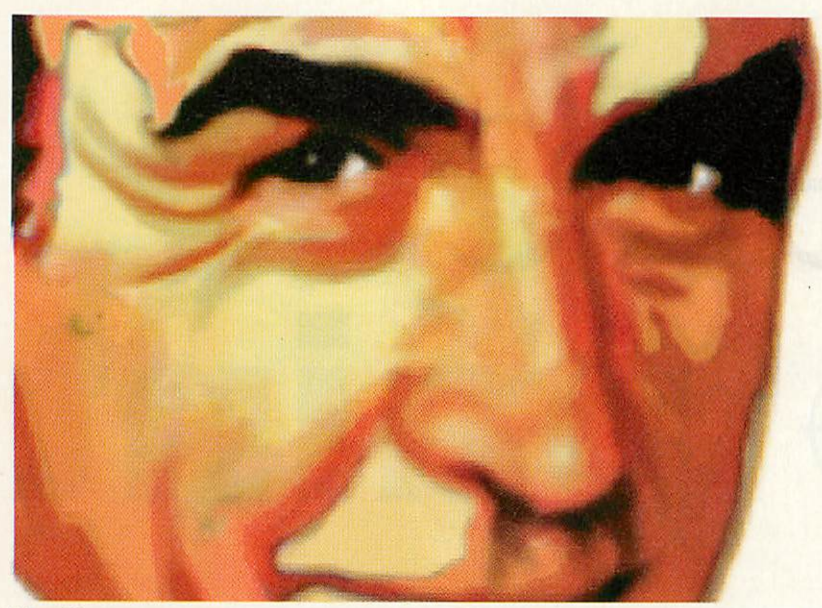


Figure III

sections that are over-worked, so the dimensions remain the same.

But there is one problem that applies to all masks, whether 1- or 8-bit; and that is, on a subtle surface like a face, the edge of the mask will appear very well defined, and obvious. So whenever possible work free hand within the area of the face. Don't worry about going over the edge onto the background, you can always re-spray that, or work inside the outline mask.

This means the airbrush must be set at a very low opacity. In *Studio24* I work at 3% or lower when painting the wider areas like the cheek; but the opacity would rarely go above 8% on any section.

Now this will vary from package to package, and in *Photodesk* the equivalent would be between 10% and 15%. So probably the single most important message at this point is – **patience**. There is no way to hurry airbrushing, even on a computer.

Smoothing tones

With only the bags under his eyes complete, I moved on to his nose, progressively working with those same colours. The nose was given definition with the highlight down the leading edge. Using the mask again, since this was one area with a clearly defined edge, I resprayed not the lighter area of the nose, but the line that would be the shadow once outlined, the nose 'leaped' into focus.

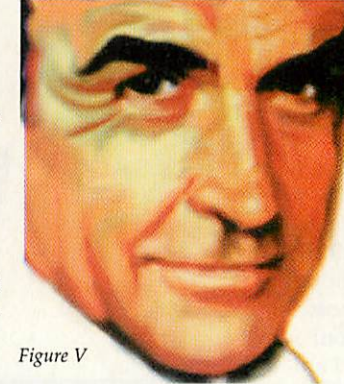


Figure V

The nose was smoothed with the smudge brush, which I cheat with on a regular basis, pulling the colour down the length of the proboscis. You can see this effect has been used on the lines at the corner of his right eye. You don't have to use this brush, it's just useful for getting the colour round into the right place, with a very smooth edge.

Next I sprayed the highlight onto the nose with a very pale cream (almost white) and a brush almost the width of the highlight, building the colour very gradually.

The side of the nose was also 'pulled' into focus with the smudge brush. Another problem with airbrushing is when to stop. There's no formula, so save out your work on a regular basis, perhaps under different names.

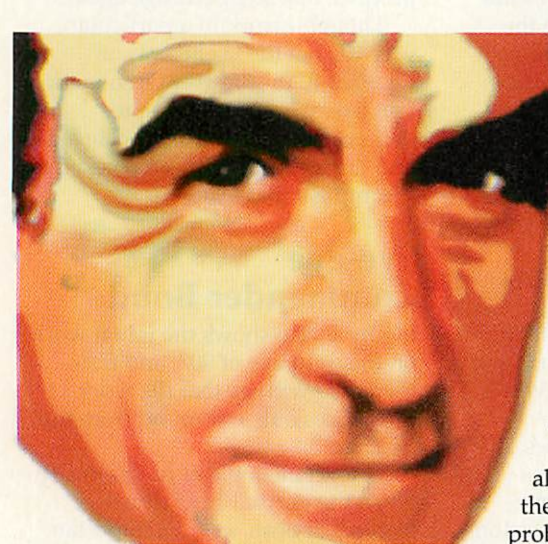


Figure IV

Nose on down

Since the mask included the shadow under the nose, along with the nostril, this was the section I began to work on next. The top lip is really defined by the shadows, so little work was done with highlights, if you use them too much, it looks like he's sweating.

The line of the mouth was just softened a little with the mid-tone, using a fine nozzle on the brush. The famous smile was already in place, defined by the shadow at the left corner, and the lower lip characterised by a thick shadow underneath. This shadow under the lower lip was kept much lighter, otherwise the lip looks as though it's protruding like he's been either punched, or just visited the dentist.

Face right

The mouth was more or less complete, and so I graduated down to the chin. Here, as in other places, I sprayed the soft tones with a circular movement.

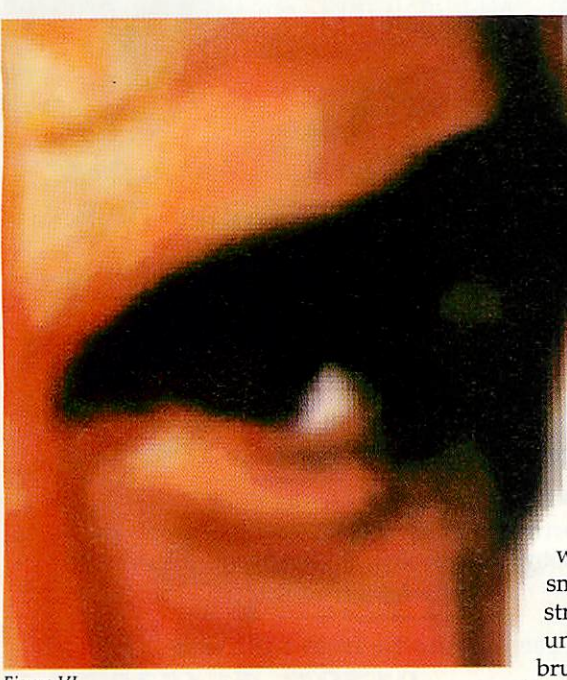
When airbrushing, as with most paintings it's generally a good idea to work in the direction of the natural shape. One thing worth mentioning with airbrushing (or computer work, where there is a continuous application of colour) is to keep the tool moving as long as colour is being applied, this will avoid unwanted build up of colour [it also helps to have a clean mouse when attempting this sort of work – Ed].

In places of strong colour, such as the highlight on the nose tip I would keep the airbrush still, and allow the colour to build up gradually. The chin had very little tone applied, using a large brush – about the width of the lower lip.

Once the nose and chin were completed (you will see that most areas are reworked in the finished 007) I moved over to the left side of his face. Here the shapes, visible from the original application of colour through the mask, only needed to be softened, this time by spraying the same tone around the edges.

Laughter lines

The creases around the mouth of Mr Connery are a integral feature of that distinctive smile, and became the next region to work on. Unlike the

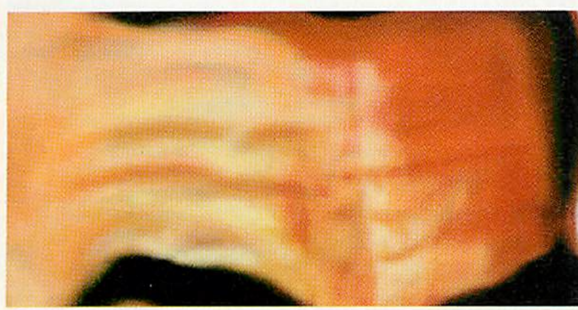

Figure VI

laughter lines round the eyes, here I used only the airbrush, since the lines were softer and wider. I alternated between the lightest and darkest colours, adding shadow, then highlight.

The smudge brush *was* used to blend the end of the line on the right side of the face, where it disappears into the cheek. The black smudge beneath his chin, is not the beginnings of a beard, but the 'dickie bow tie'; put in here just to help me make sure that the chin shape is right.

Eye of the beholder

Once the lines round the mouth were in place, I moved back to the left side


Figure VII

of his face to finish the other eye. This magnified shot of Bond's left eye (Figure VI) shows how simple the details actually are. The realism is in the shape of the eye, the details are added by the viewer.

If you look at the smaller version of this eye, you will see that it appears very detailed. Almost all the eye is in deep shadow, only the raised bone area below the eyebrow and the white of the eye stand out.

This close-up also lets you see that the lines below the eye are fairly crude, but soft and gentle like human skin, which only the airbrush can produce. It was while working on the eyes that I 'pulled' some colour over the bridge of his nose onto his forehead to see how the eyes were developing against a paler hue. Since I had moved back up his face, I began working on his brow next.

The lines on his brow were painted with a very small brush and at a slightly stronger opacity than unusual. Next I increased the brush size to the width of the finished frown mark, and, decreasing the opacity, sprayed along the original line.

This is where the airbrush comes into its own. Gradually the frown will appear, and Mr Bond's quizzical raised eyebrow will fit into place.

Once you're happy with the lines, load your brush with the lightest tint, and a brush slightly narrower than the distance between the frown marks and spray in the highlight. Gradually you will see the light reflecting from 007's furrowed brow.

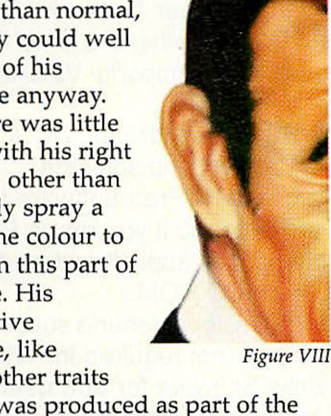
It may be a good idea to gently smudge the darker lines to soften and blend the colours, allowing the red to emerge. This was done with all the lines on Mr Bond's face, the highlight being the last tone added. It's not a rule, but with an airbrush I find it best to work from dark to light.

Hair piece

As you can see from Figure VIII, Mr Bond's ear and hair were worked with a small brush. It was just a case of following the contours of the mask lines in his ear and highlighting the sections in between. As can be seen in this instance, spending a lot of time creating masks with numerous features allows you to concentrate on the painting instead of worrying about getting the shape or the perspective right.

His hair was first filled with a flood fill, then around the temple and front flick I used a small brush and basically drew in numerous hairs. Of course, as you can see round the temple area, the hairs are much thicker than normal, but they could well be part of his disguise anyway.

There was little to do with his right temple, other than to gently spray a mid-tone colour to blend in this part of his face. His distinctive hairline, like many other traits of his, was produced as part of the mask, so most of the work was already done.


Figure VIII

The end of Mr Bond

Most of the facial features of Mr Bond are now done. The white collar and black tie will round-off his portrait, but the complete Mr Bond will have to be finished by you.

His black jacket is straightforward enough, and as you'll see there are only a few details on his sleeve. If the editor deems it worthy, the final version of the secret agent will be big enough for you to see his hand well enough for you to copy it. The gun barrel is simply a circle with a black centre.

The outer details of the gun are small blue spheres, and the trigger-guard a blue line with softened and darkened edges – the hard, bright reflections giving the metal a polished 3D look. His hand of course is detailed, but now you're well qualified to airbrush this one your own. END


Figure IX

PC Cards Again Cheaper than ever!



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Our Web page on Benchmarks shows the tiny effect of a larger cache or a 133MHz processor; the processor we offer here has a heat sink fitted and does not need a fan DirectX/VESA support does not generally benefit from more than 128KB cache anyway.

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RPN messages

Part 6 of Michael Cowgill's series on MIDI controllers

Greetings again, MIDIphiles. This month we shall be looking at Registered Parameter Numbers or RPNs. RPNs arrived on the MIDI scene with the advent of General MIDI, and were not part of the original MIDI specification.

As most of you will have GM-compatible devices this should not be a problem unless you are trying to program a pre-GM device like a DX7 or CZ1000.

Like the NRPNs, RPNs are controlled by sending a Most Significant Byte (MSB), a Least Significant Byte (LSB), followed by the necessary Data controller messages and an RPN Null message.

The following RPN messages are currently defined by the MMA:

- Pitch bend sensitivity
- Fine tuning
- Coarse tuning
- RPN Null

Details of how to use them can be seen in the two figures provided with this article, both taken from Yamaha's excellent PDF document XG Interactive Online Help, to be found on their UK Website www.yamaha.co.uk

No doubt other RPNs will be defined in future, particularly as the MMA currently has plans to bring the MIDI specification into the 21st century in the form of MIDI 2.0, which will provide support for DAT, harddisc recorders and the bewildering array of other paraphernalia which populate a modern music production studio: this is not finalised yet, but keep a look out for it. In the meantime, the MMA has provided control over three of the most commonly desired functions.

Pitch bend sensitivity

Those of you who read my article on the Pitch Bend and Modulation controllers will remember that I mentioned that Pitch Bend Sensitivity (or the amount that the pitch wheel bends the note) was controlled by an RPN. Here then is the information you have been waiting for. For this particular RPN, the Data LSB is irrelevant, and therefore need not be sent.

The number of semitones you would like the note to bend at the full extent of the wheel is sent in the Data MSB message: the amount you will be able to bend will depend on the manufacturer of your synth.

Yamaha's modules all seem to have a limit of ± 24 semitones (2 octaves), which I should have thought would have been enough for anyone.

Fine tuning

We have all, no doubt, experienced the annoyance of finding that two of our synth modules are not quite in tune when used with factory settings, and if they are in the form of external black boxes it's usually a fairly easy process to tweak one, or both, so that they are in tune with each other, or an outside source.

But in today's world, where very often the module is mounted on a PCI card, or a RISC OS sound card such as the DMI, the situation is a little more difficult, and the reason for the inclusion of this message becomes clear. You will need to consult the documentation provided with your module to find out the exact implementation, but most commonly you will find you can control the tuning by ±100 cents (hundredths of a semitone).

I remember one occasion when I was taking part in a joint church service at which the Archbishop of York was presiding, when this amount of tuning control was not enough, the organ being sharp by about a semitone and a half.

In the end the organist and the synth players agreed on a degree of out-of-tuneness which didn't grate on the ear too badly.

One thing to remember when dealing with this parameter is that MIDI is a 7-bit system (due to it being a serial communication protocol), consequently the LSB is bits 0 to 6 and the MSB is bits 7 to 13.

This means that normal hex conversion routines won't work (including calculators), and you will have to do your own conversion with pencil and paper. If you need help with this, e-mail me.

Coarse tuning

Coarse tuning is equivalent to transposition. Again this is an MSB-only parameter, the LSB being ignored if sent.

The usual implementation of this is to make possible values of ±24 semitones, -24 being represented by 40, no transposition by 64, and +24 by 88. Again, check your module's documentation for details.

Well, I appear to have run out of space yet again. I hope you all have fun with RPNs. In my last article I shall be talking about Channel Mode Messages, and how they can change your life!

END

Bnh	65h	00h	RPN MSB (cc #101)
Bnh	64h	01h	RPN LSB (cc #100)
			(selects the Fine Tuning parameter)
Bnh	06h	dd	Data Entry MSB (cc #6)
Bnh	76h	dd	Data Entry LSB (cc #38)
			(sets the Fine Tuning value)
Bnh	65h	7Fh	RPN MSB (cc #101)
Bnh	64h	7Fh	RPN LSB (cc #100)
			(sets RPN to null)

Note: n = MIDI channel number. dd = Data Entry value (00h - 7Fh, corresponding to a decimal range of -64 to +63).

Changing the fine tuning with data entry

RPN MSB (cc #101)	RPN (cc #100)	Parameter
00h	00h	Pitchbend Sensitivity
00h	01h	Fine Tuning
00h	02h	Coarse Tuning
7Fh	7Fh	RPN Null message

Contacting me

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Big discs

David Watkins tries to install a big SCSI drive

Have you noticed how the cost of harddiscs has dropped? For the price of my first harddisc, which was all of 20Mb, I can now buy a 16Gb drive. That's an 800-fold decrease in the cost of storage.

Nevertheless, it wasn't until RISC OS 3.6 came along that Acorn users had an operating system that could access drives larger that 512Mb.

Recently I was offered a 4Gb Seagate Barracuda harddisc from an NT network server, where it was being replaced by a 47Gb drive. Naturally I jumped at the chance to use it on my StrongARM Risc PC, but I didn't have a spare SCSI-2 card.

I tried my Morley SCSI-1 card (v1.18) but it wouldn't even recognise the device. I checked with Gary Partis, who wrote the firmware for the Morley card, and he explained that I needed the v1.19 ROM – or an Alsystems PowerROM upgrade which he'd also written – to access big drives.

Morley hasn't been supplying equipment for the Acorn platform for some years now, but luckily they were able to find an upgrade ROM and Utilities disc for me.

Sadly, while the Devices list showed the harddisc size as 4096Mb, the Partitioning option only showed 2048Mb, so the Morley card was usable with v1.19, but I would have to make do with only getting two 1Gb partitions from the 4Gb drive.

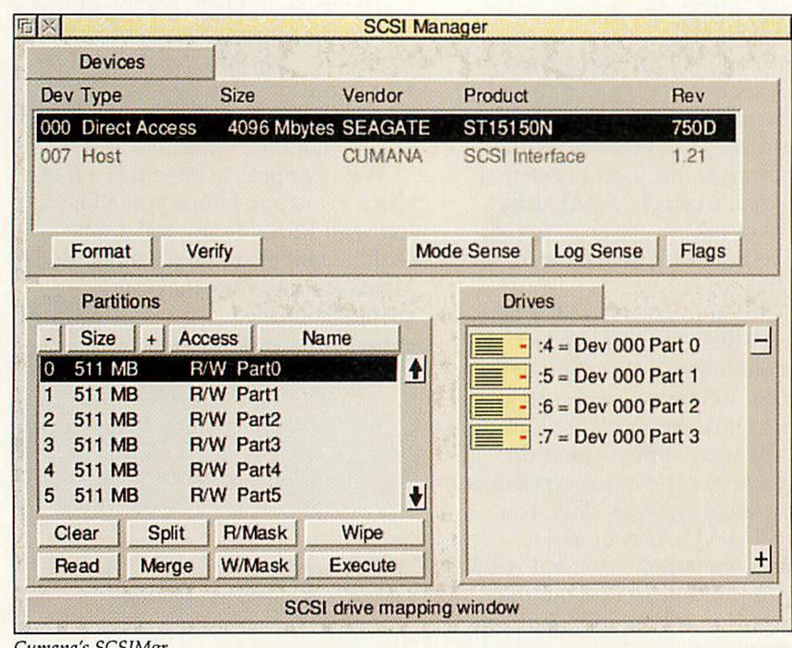
The drive icons were arranged on the iconbar from left to right, rather than from right to left, and this took a little getting used to. But what makes the Morley card a real pain is having to wait for the drive to spin-down, then up again, every time a Shutdown takes place.

My next attempt involved liberating the Cumana SCSI-1 card from my A5000. This card, along with the current SCSI management software on the Cumana Website (http://www.cumana.demon.co.uk/sales/sc2.html) enabled me to create eight 511Mb partitions and to assign four of them to disc icons on the iconbar. I could still only access half the disc, this time as four 0.5Gb partitions.

However, I could configure any four of the eight partitions as RISC OS drives and, by switching partitions in and out, I found I could maintain backups of my four working partitions on the unused half of the disc. Not the best of solutions, nor the most secure backup method, I know.

Cumana did have plans to release an upgrade for Cumana SCSI 1 users to get over this 512Mb partition size problem.

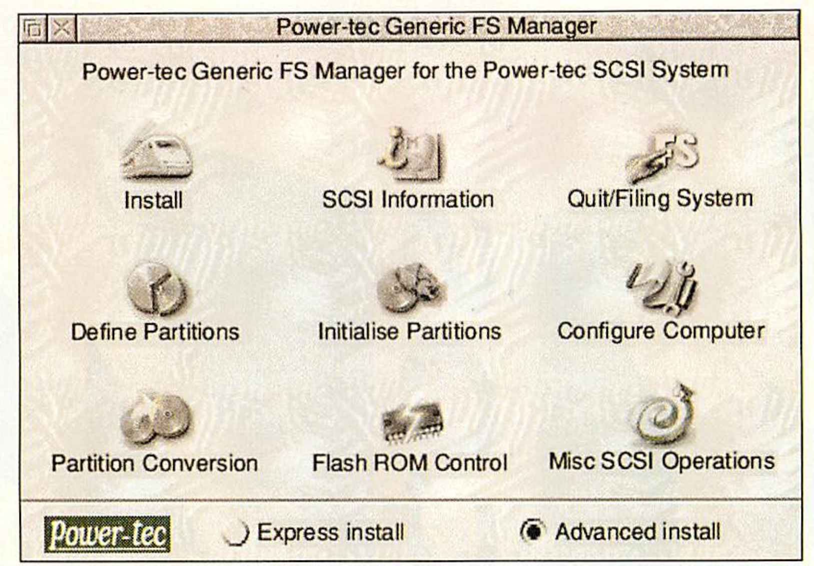
They did some advertising but it seemed that the majority of customers didn't require it, so it never came to market. If there are customers that require this upgrade please



Cumana's SCSIMgr

contact sales@ cumana.co.uk The cost of the upgrade was going to be £35.00 + VAT. It was at this stage in the proceedings that my newly acquired 4Gb harddisc stopped working.

It wouldn't spin up and it screeched loudly when I tried to access it. I checked on Seagate's Website and, to my surprise, I found that it was still in warranty. I had to return the drive to Amsterdam, from where Seagate (Europe) operate their technical and warranty support, and a replacement was despatched forthwith.



The new version of Alsystems' PowerMgr

The delay gave me time to arrange the loan of two PowerROMs, from Alsystems (http://www.alsystems. co.uk) so that I could compare the effect of upgrading different makes of SCSI-1 interface.

This would be an intermediate option between spending nothing, by using an existing SCSI-1 card, and buying a SCSI-2 interface for £160 or so. The PowerROMs cost about £40 each. This article is not intended as a PowerROM review and as such it cannot do justice to the Alsystems product.

Suffice to say that the PowerROM gives third party SCSI-1 cards the functionality of SCSI-2 and versions are available for Cumana, Castle Technology, Morley, Lingenuity, Acorn, VTi, HCCS, Oak and Technomatic cards. Note, Cumana do not offer any free support on their SCSI-1 cards once the PowerROM upgrade has been fitted. I installed PowerROMs in both my SCSI-1 cards and the results were pretty impressive.

The latest version of the Power-tec configuration utility, *PowerMgr*, gives full control of the partitioning and, with both cards, I was able to address the whole 4Gb as a single partition – just what I need for editing big samples.

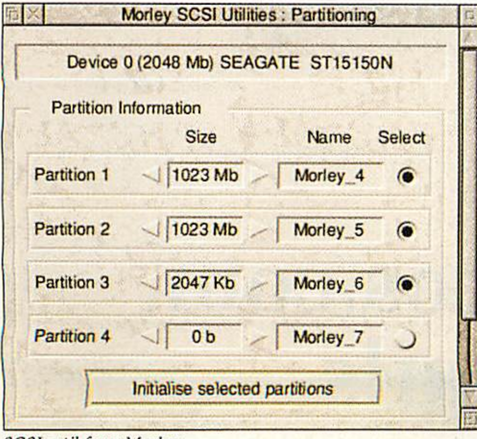
The Power-tec filing system provides a host of options that were previously unavailable, such as control of the spin-down timing and the stacking of icons on the iconbar.

The output was identical for both the cards I used with one exception – if the reported transfer rates are to be believed – it seems that the Morley card is 50% faster than the Cumana.

So there you have it. If you want to put a big SCSI drive on your StrongARM Risc PC you have three options:

- You may be able to use an existing SCSI-1 interface but access will be limited. Cost, zilch.
- Upgrade your SCSI-1 filing system to SCSI-2 functionality with a PowerROM. Cost, about £40 (£60 to include a second-hand SCSI-1 card).
- Buy a SCSI-2 card. Cost, £154 + VAT with free technical support from Cumana.

There are some further options, with costs above £200, but I haven't considered them. END



SCSI_util from Morley

Contacting them

Cumana
Tel: 01279 730 900
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Objets de désir

Greg Scott goes all continental with C++

Just when you thought it couldn't get any trendier, this month unveils function overloading, friendly functions and operator overloading. But first, this...

References are a small but valuable addition to C++ and very worthy of a mention. They are used in call-by-reference addressing and help to avoid the common struggles associated with traditional pointer handling. Consider first the following function which sums three parameters and stores the result in place of the leading argument:

```
void sum_store(int *first,int second,int
third) {
  *first=(second + third + (*first) );
}
```

The following expression calls the function:

```
sum_store(&a,b,10);
```

We pass the function the address of the integer **a**, so that the dereferencing operator '*' can be used in the regular way. The use of pointers can be avoided altogether by using a reference. A reference is a parameter preceded by the **&** symbol (or whose type is followed by the symbol) which is treated as a normal variable local to the function. The reference means that the real variable (and memory location) passed to the function is operated on, just as in the previous example. The above function has been re-written now using a reference:

```
void sum_quick_store(int &first,int
second,int third)
{
  first=(second + third + first);
}
```

The compiler is clever enough to recognise the reference and, hence, there is no need to specify an address when calling the function (or return a value from the function, in general):

```
sum_quick_store(a,b,10);
```

This code would result in the first argument containing the sum of itself, the integer **b** and the number 10. As a result of the underlying call-by-reference, the actual value of **a** was altered. As you can see, references are an efficient and tidy alternative to traditional pointer referencing.

Function overloading

A useful facility of C++ is the capacity to define two or more functions (including constructors) of the same name. This is particularly useful when handling parameters of a different number or type. The compiler will deduce which version of the function to call by the properties of the arguments passed:

```
class person
{
char *name;
int age,height;
public:
person(char *);           // first
constructor function
person(char *,int,int);   // second
constructor function (overloading)
}
```

An instance of the person class can then be created in two different ways:

```
person peter("John");
person susan("Susan",21,165);
```

This polymorphic property of C++ allows classes to become more versatile in their handling of different situations. In early versions of C++ the overload keyword was used to inform the compiler about the name clash. In the above example, the line:

```
overload person;
```

would have been included before any function definitions of the same name. Modern compilers, however, will not usually require special notice of the overload.

One point to watch out for is that in some circumstances legal-looking overloading will not work because the compiler can't decide which overloaded function is the right one.

Inheritance returns

The **protected** keyword, like the **private** and **public** specifiers, is used to define the access rights to members of a class, and how such members are inherited by a derived class. As you know from last month, a private member of a base class is not accessible by external parts of a

base class
derived class
private
private members
inherited and new private members
protected
protected members
inherited and new protected members
public
public members
public members
class derived: private base
class derived: public base (or specific declaration of access)

Figure I: A summary of inheritance

program, including any derived class. Protected members behave differently in this situation.

Although (like private members) protected members are accessible only from within the same class, they are still available in any derived class. Here is an example:

```
class basic
{
protected:
int a,b; // private to this class, but
inherited by a derived class
public:
no_problem();
};
class derivation:public basic
{
int d ;  // this class also accesses a
and b from basic
public:
no_problem_here() { d=a+b ;}
};
```

If the **a** and **b** members of **basic** had been declared as private (and not protected), the program would not compile – an error would be generated because no_problem_here() depends on the availability of **a** and **b**.

In this example, the **basic** class is publically inherited, that is to say that any public members are made public in the derived class.

Likewise, all protected members are made protected. If the syntax had been:

```
class derivation:private basic{... };
```

then all public and protected members would become private members in the new class.

The code would still compile in this case because access rights are not compromised. Figure I summarises the situations that occur as a result of varying class and member access specifiers.

Multiple inheritance

There is no programming law that prevents a class being derived from an already derived class, and so on. The three different keywords (**private**, **protected** and **public**) would allow a great deal of control over the properties accessible by each level of such a structure.

Similarly, it is possible for a class to inherit properties from two or more classes at the same time. To use this facility we separate each access operator and base name by a command:

```
class derived:public base1,public
base2,private base3
{ ... };
```

The derived class in this example would inherit any protected and public properties of **base1**, the same for **base2**, and (all as private properties) similarly declared members of **base3**. It is important to include an access specifier for each inherited base. Several issues are raised because of the inheritance of extra constructor and destructor functions. Firstly, we must consider the order in which such functions within a derived class are executed. Secondly, we need a mechanism to pass parameters to multiple constructor functions.

To begin, look at this example:

```
class base{
public:
base()
{ printf("Constructing base.\n"); }
~base()
{ printf("Destructing base.\n"); }
};
class derived1: public base{
public:
derived1()
{ printf("Constructing derived 1.\n"); }
~derived1()
{ printf("Destructing derived 1.\n"); }
};
class derived2: public derived1{
public:
derived2
{ printf("Constructing derived 2.\n"); }
~derived2
{ printf("Destructing derived 2.\n"); }
};
main()
{
derived2 demo; // construct demo
return 0; // end program, deconstruct
demo
}
```

The output of this program (which simply creates then destroys a class of type **derived2**) is:

Constructing base.
Constructing derived 1.
Constructing derived 2.
Destructing derived 2.
Destructing derived 1.
Destructing base.

Similar rules apply for multiple base inheritance, such that for a derived class:

```
class derived: public base1, public base2
```

The order of constructor execution would be **base1**, **base2** then **derived**. So how do you pass arguments to inherited, base class constructors? Let us consider another example:

```
class base
{
public:
base(int x){...} // base constructor
};
class derived : public base
{
public:
derived(int a,int b) : base(a) { ... } //
pass a to base constructor
};
```

Because the **base** class requires an integer for its constructor function, we have to make provisions to supply this argument when the derived constructor is defined. In this example we have passed on the parameter **a** to the derived class. To pass arguments to multiple constructor functions, we must use an expanded form of this system:

```
derived_constructor(argument_list) :
base1(argument_list),base2(argument_list)
...
{ // derived constructor code here }
```

Making friends

It is possible to grant a *function* that doesn't belong to a class access to private members of that class. This is done using the **friend** keyword. A friend function is allowed access to all public, protected and private members of a class. To declare a friend function, we include its prototype within the class and define it later. Here is an example:

```
class first
{
int x,y,z;
public:
friend int multiply(first var);
reset(int a);
};

first::reset(int a) { x=y=z=a; }
int multiply(first var) { return
(var.x*var.y*var.z); }

main()
{
first mine;
mine.reset(0);
printf("%d\n", multiply(mine) );
}
```

The first thing to note is that **multiply()** is not a member of the class, but a friend function with access to private members. We call **multiply()** in the normal way, passing it an object with which it can work. Friend functions generally encourage more efficient code, and facilitate easier interfacing between normally 'uncooperative' classes.

A friend function may also be a member of another class. Rather than writing just the function prototype, we must preceed it with its class name

and the scope resolution operator '::':

```
owner_class::function(argument_list);
```

Friendly classes

One class can be made a friend of another class. A friend class has access to all normally private members of another, just as with a friend function. Consider this example:

```
class one;
class two;
class one
{
int x;
public:
set(int y) { x=y; }
friend class two;
}
class two
{
public:
clear(one var) { var.x=0; }
};
```

The first thing to notice is the 'forward referencing' of the two classes at the beginning of the program. This is done to make the compiler aware of these classes before they have been defined in full.

The **clear()** function takes a parameter of type **one**, and (because it is a friend function) has access to the **one.x** variable.

It is critical to understand that when one class is a friend of another, it only has access to names defined within the other class. It does not inherit the other class – the members of the first class do not become members of the friend class.

Operator overloading

Incredibly, just as we can overload functions, we can also overload C++ operators (such as those in Figure II). Overloaded operators can perform special functions relative to a class. For example, a stack class might overload the '+' operator to perform a push operation (placing an item on the stack).

Operators are overloaded by creating an operator function. This defines the specific operations which will take place when the operator is used. Operator functions can be either members or nonmembers of the class that they will operate on. Remember that an overload does not generically replace all occurrences of a certain operator, only the ones which involve a particular class.

The way operator functions are written differs between member and nonmember functions. This month we shall look only at member functions. Member operator functions use this general form:

```
return_type class_name::operator#
{ ... } (argument_list)
```

An operator function will usually return an object of the class they belong to, but **return_type** can be any allowable type. When you define an operator function, replace the '#' with the operator which you wish to overload. So to overload the addition operator, use operator+.

The parameters which the function must take depends on what type of operator we are overloading. If the operator is unary (for example, **x++**) the argument list is empty. If it is binary operator, taking two operands (i.e. **7 + 6** or **x * y**) just one argument is passed.

Let's look at an example:

```
class loop
// this defines a class which cycles an
integer value
{
int c,max;   // max defines the end value
public:
loop() {}         //constructor function 1
loop(int x) { c=0; max=x; } // constructor
function 2
print() { printf("loop pos. is : %d\n",c);
}
loop operator+(int v);
// overload the + operator for loop classes
};
loop loop::operator+(int v)
{
loop temp;
temp.max=max;
temp.c=c+v;
if(temp.c > max) temp.c=(temp.c-max);
return temp;
}
main()
{
loop ten(10);
ten.print();  // loop pos. is 0
ten=ten+5;
ten.print();  // loop pos. is 5
ten=ten+5;
ten.print();  // loop pos. is 10
ten=ten+2;
ten.print();  // loop pos. is 2
}
```

The program overloads the + operator relative to the loop class. Because expressions such as

```
ten=ten+5;
```

involve this loop class, the overloaded version of the operator is called. Let's look at this function now. The first thing to notice is that although the addition is a binary operator, we only pass one argument. This is because the operand on the left of the '+' is the loop class itself (this assumption involves something called the **this** pointer, covered next month). Within the function we create a temporary instance of the **loop** class (using the overloaded class constructor which takes no arguments). We do this so the line:

```
return temp;
```

matches with our use of the assignment:

```
ten=ten+2;  // ten becomes temp
```

Without this system, there would be no logical way of reassigning the result of the addition.

It now becomes clear why operator functions return objects of the same class type as themselves. Within the **operator+()** function we use the temporary class to hold existing and new properties of the operation:

```
temp.max=max;
temp.c=c+v;
```

The variables **max** and **c** are all members of the class which invoked the function call. We have to assign the **max** value to the **temp** class or else when we return from the function, **ten.max** would not be preserved. We could have avoided this line entirely by using the other type of constructor function to create the **temp** class:

```
loop temp(max);
```

We'll now overload the unary '- -' operator to cycle the loop backwards by one. Here is the code for the new **operator- -()** function:

```
loop loop::operator- -()
{
loop temp(max);
temp.c=c-1;
if (temp.c<0) temp.c=max;
return temp;
}
```

We can now use the overloaded '- -' operator in a new way (see example four on the coverdisc):

```
ten=- -ten;
```

Next month

Next month we'll look at class arrays and pointers, and how virtual functions and polymorphism are used to make versatile and re-usable code. We'll also finish off operator overloading, and see how this helps the programming stage of a Matrix project. END

Common C++ operators

+	+=	<<
-	-=	>>
*	*=	++
/	/*	- -

Figure II: Operators to overload



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The RISC OS 99 SHOW

Typhoon coming

Richard Goodwin takes a close look at the latest flight sim

Alasdair's away this month so he's asked me to hold the fort for him. It's therefore fallen to me to review this month's latest game release – *Eurofighter Typhoon* by Dave Watts.

Given that the general consensus still has the ageing *Chocks Away* as number one flight sim on the RISC OS platform, perhaps it's about time that someone had a crack at this title; and it was with a little shock that I took this reviewing assignment only to find that my computer, which I use every day as my main work machine, no longer measures up to the recommended spec for a new release.

My 202Mhz StrongARM weighs in a little shy of the 233Mhz minimum spec, the domain of only the latest upgrades and J233 Risc PCs. However, given the alternative – Alasdair's 40Mhz Arm700 machine – it was decided that, with one eye on the frame rate, the best thing to do was carry on.

So, the game has a minimum requirement of only the best processor available and is supplied on CD; also, although my copy came *sans* packaging, it was accompanied by a comprehensive manual. Apparently the design process took in a visit to the BAe stand at Farnborough where the author got to climb into the cockpit of the genuine article. In RISC OS circles all this preparation and attention to detail is pretty unusual. I prepared myself to be impressed.

Getting started

One of the first problems was with the monitor definition file – as I already had two definitions for 640x512 screens, I thought I could get away with it, but no, it has to be 75Hz, not the 74Hz one I had. Instructions and a partial definition file were provided to update your MDF, but it's a minor niggle that could be a little off-putting for the non-technical.

Another slight irritation was a warning that third-party joystick interfaces such as Stuart Tyrrell's *PCJoy* wouldn't work because 'the parallel port is too slow', which was annoying as I just happened to have one of these interfaces and a rather nice joystick. After deciding to ignore the problem I found that in reality it worked fine for me using emulation, which should be even slower than native support.

Once this was sorted, it was into the game proper – or rather, I ran the game, but it loaded the accompanying flight trainer instead. A series of static intro shots ensued, which are attractive enough the first few times but as you can't hurry them up they can get annoying after a while.

Eventually up comes a reasonable rendering of a briefing room, however the text up on the board was presented in the Acorn system font – a failing of many a home-grown game – and it flickered badly, which, even remembering my lesser processor and my vow to forgive any flickers, seems a bit odd when you're viewing a static screen.



Taking off

Into the trainer then, and given the author's obvious love of his subject and attention to detail I can only presume that the simulation aspects are pretty damned accurate. There are the usual myriad keys to control the various parts of the aircraft: flaps, undercarriage, and so on.

There's perhaps too much attention to detail in places, such as the engine needing ten seconds to warm up before the 'plane can be throttled up – you can use the time to do a pre-flight sequence and set up the HUD, switch on the autopilot and so on, but again it slows down the process of getting into the game.

The graphics are okay, but nothing to write home about – they will be familiar to those of you who remember the heyday of RISC OS flight sims, taking in the two

Interdictor titles and especially the myriad *Simis Flight Sim Toolkit* spin-offs, especially *Mig 29 Superfulcrum*.

This was somewhat of a disappointment given the minimum computer spec and CD distribution; the older games ran on 8Mhz machines, albeit at a lower resolution, so the need for such a fast processor for this game is curious to say the least. And for a game that has such accuracy elsewhere, there are some obvious problems, such as being able to fly through mountains.

To be fair though, the game never crashed on me once, and there are some nice details even in the trainer – other aircraft on the airfield which take off with the passage of time, trucks and



Landrovers dotted around, and, while flying missions, you see warships docked near airfields and even sailboats out on the water. It's hardly new, but at least it gives you something to look at. You can also use the keypad to look all around you.

Back to earth

It is sensible having the option to learn the tricks of the trade before going into battle but the implementation here was a little too rigid for my taste – you're forced into the training school, where you have to complete three good landings, attack a target drone and a few ground targets then land, and finally use the bombsight to drop dumb bombs.

This might not sound much, but it takes time to learn each skill – I'm no slouch when it comes to most games, but even landing is a tricky operation that takes quite some time to master.

The most annoying feature of the game is that it doesn't save your progress – I only had a few hours each night before my body demanded sleep, so the next night I'd have to start pretty much all over again.

Frankly those dumb bombs are impossible, even when following the instructions to the letter: when you're looking down the bomb sight and can't see where you're flying, you have a tendency to nudge the mouse or joystick to one side and see your bomb drop millimetres away from the target.

In desperation I stopped reading the manual and hunted through the accompanying text files for a way to cheat and, after failing for another night to follow the bombing instructions, I eventually found a keyboard shortcut to exit the training school.

After that it was into the game proper, for more of the same; after so much time in the training school I overran my deadline considerably, hoping that I'd find some really good reason to recommend this release, but to be honest if it wasn't for the fact that I had a review to do I might have given up much earlier.

I don't mean to be overly negative as it's not a bad piece of software, but when it comes down to it I think that a lot of gamers will be put off



by the lack of adrenalin-pumping action; it's a pure simulation, not an arcade game, so there's more flying around looking for something to kill than in 'lesser' games such as *Interdictor* or *Chocks Away*.

In summary

When someone has quite obviously put their heart and soul into something over a long period it's not easy to be so critical, but in the end *Eurofighter Typhoon*, for all its high spec requirements, brings nothing new to the genre, especially with RCI's *F16 Fighting Falcon* just around the corner.

The price is reasonable – and a donation goes to the RAF Benevolent Fund for each copy sold – but with its steep learning curve and lack of immediate action this is probably one for the simulation fans and military purists rather than casual gamers. END

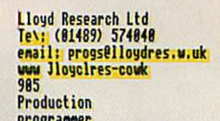
Product details

Product:	Eurofighter Typhoon
Price:	£24.95 inc VAT (a donation will be made to the RAF Benevolent Fund for each copy sold)
Supplier:	Dave Watts, 5 Charlton Road, Midsomer Norton, Bath BA3 4AB
Tel:	01761 418773

Sleuth 3

No matter which scanner you buy, if it was originally intended for use on a PC or Macintosh you will almost certainly be given a 'lite' version of an OCR package. This is almost always effective to a point, but when you demand accuracy it's no good. So what's the solution?





Sleuth 3 is the latest version of the acclaimed OCR package for RISC OS computer systems. The editor has been enhanced (above that of Sleuth 2) to allow greater control over the OCR'd text including the ability to insert/remove paragraph breaks and amend identical errors easily. Greater accuracy has been achieved, especially with degraded images. New font information – a total of 114 fonts and styles – has been added including more mono-spaced fonts. Sleuth 3 will now recognise mono-spaced fonts and has the ability to output them in Rich Text Format (RTF), which can then be loaded into any word processor or DTP package that supports RTF (including Ovation Pro and EasiWriter).

While Sleuth 3 can be used on any machine with RISC OS 3.1 and 4Mb of RAM, we recommend use on a Risc PC, A7000+ or similarly specified machine for the best performance.

The usual RRP of Sleuth 3 is £116.33, but we have negotiated with Beebug Ltd to offer Sleuth 3 to you at just £105

The key new features of Sleuth 3 are:

- Full multitasking editor, allowing you to correct mistakes while the OCR routine is running
- Ability to achieve over 90% accuracy on recognised fonts, using good quality 300-400dpi images
- Text conversion at between 80 and 250 words per minute
- User-definable or automatic zone creation can be used to choose which part of the image to convert
- Editable user dictionaries
- Foreign language dictionaries
- Batch processing
- Import of greyscale sprites
- Editor enhancements
- Automatic page orientation
- Improved accuracy

ACOR
Read

How we used to live

The award-winning How we used to live series from Granada Learning encourages children to use the sources provided – be they video, textual or otherwise – to understand different periods of history in a fun and exciting way. All three CD-ROMs are based on the popular Yorkshire Television series.

In this exclusive Acorn User reader offer, you may purchase the set of three CD-ROMs at a much reduced price – so what do you get?

Early Victorians

This award-winning CD-ROM combines a fictional story line with a considerable database of historical information. The content supports the History National Curriculum for Key Stage 2 and includes the following topics: Trade and Industry, Transport, At Work, Domestic Life, and Leisure and Education.

A slide show documents the life of the Coggan and Harrap families in 1845, touching on major events of the period. A Biography section enables pupils to study characters, events and topics within their historical context. An animated Time Chart puts people, events and developments visually into context.

Late Victorians

Late Victorians is the second How We Used To Live CD-ROM. This unique multimedia tool brings history to life in the classroom. The disc tells the story of the Harrap family against the background of middle-class Victorian life between 1849 and 1915. A stunning visual design is set against a backdrop of easy-to-read text, period paintings, archive pictures, photographs and much more, to create a fascinating multimedia tool.

Designed to support in-depth investigations into history, this CD provides information on topics such as: The Changing Position of Women, Political Reform, Education and Schooling, Modernisation, Social Class Poverty and The Monarchy.

1936 – 1953

The third How We Used To Live CD-ROM looks at the lives of the Hodgkins family, their friends and neighbours during the period 1936 to 1953.

Historical events are highlighted using an extensive database of video clips from the television series. Pupils can research information under the broad headings of: Economic Developments, World War II, Social Changes, Scientific Developments, and Religion & Cultural Development.

The disc enables pupils to study like real historians. Contemporary graphics, illustrations and audio create an empathy with the people and society from a challenging period in history.

So why should I buy?

All of the titles, while primarily designed for school use, contain a large number of fascinating stories and articles relating to each period given in the CD-ROM title; this makes them very suitable for use within the home.

In addition to the features detailed above, each disc contains a comprehensive set of teacher support materials, including curriculum notes and worksheets that may be photocopied.

As a reader of Acorn User you may buy the set of three CD-ROMs for £40: a 4Mb A5000 is the minimum recommended system.

Destiny



Irrespective of where you work, you will probably have come across a first-person shoot 'em up game in the same vein as *Doom*, *Quake* and so on. Up to now all these games have all been PC imports ...enter *Destiny*, the first original game of this type for the RISC OS platform.

The culmination of four years work, *Destiny* features high resolution 3D graphics, a huge variety of levels, serious fire power, intelligent enemies, original music and much much more.

The game requires either a Risc PC or A7000+ (a StrongARM is highly recommended) with 8Mb RAM and a CD-ROM drive.

Priced at £30, or £25 to Acorn User subscribers

Acorn User past CD-ROMs

We've located a small quantity of past Acorn User CD-ROMs, which we've decided to make available through the magazine as it's quite possible that some of you will not have a complete set. We're not splitting this set up, and it is strictly subject to availability – so, if you need a disc (or three) to complete your set, order now!

The discs we've found are:

- January '96 (Acorn Educational Directory – also features numerous demonstrations of educational and practical programs)
- August '96 (Collectors CD-ROM 2 – lots of Web stuff, utilities, games and much more)
- December '97 (Collectors CD-ROM 3 – Huge Destiny demonstration, past cover discs and much more).

This three-disc set costs just £5



Basic & Wimp Programmers' Toolkit

We folks at Acorn User know you like to program – that is plain enough for anybody to see. But we also know there are a few of you who perhaps don't have the time to sit down and learn, or would like it to be just that little bit easier.

In this exclusive new reader offer, ProAction are offering Acorn User readers a choice of two special programmers' packs: if you only have access to a floppy disc drive, the Basic & Wimp Programmers' Toolkits (supplied with full documentation) will serve as the ideal set of utilities to cater for your programming needs. If you have a CD-ROM drive, you may now choose the new Total Programmers' Toolkit, containing the Basic & Wimp Toolkits, Vigil and some other essential utilities for Wimp programmers.

Either way, it costs just £13.50 or £10 for Acorn User subscribers.

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Kosovo CD

Stephen Scott pores over Paul Johnson's latest effort for charity...

Paul Johnson has raised a lot of money for charity from the RISC OS community this year. Having given thousands for *Comic Relief* from his auction back in March, he has now produced a compilation CD-ROM to raise money for the orphaned children of Kosovo.

This disc has brought together every *Archimedes World* cover disc since day one, right up to its demise earlier this year. But there is so much more to be found, that this one page can barely scratch the surface.

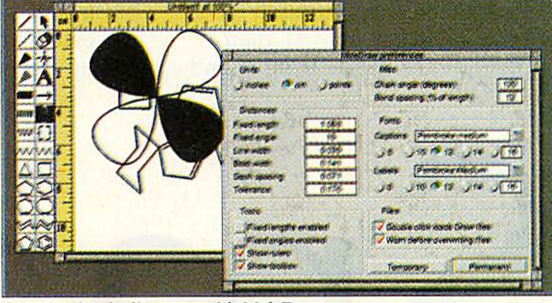
Booting up the CD reveals that CDFS' long filenames are utilised. If you have it on the desktop, ensure that Jason Tribbeck's *LongFiles* CDFS option is switched off, in order to get deeper than the root directory.

Various well-known companies have included free, unrestricted editions of their software on the disc in support of the appeal.

Computer Concepts have been good enough to include copies of *MacFS Lite*, *Audioworks* and *Compression* on the disc. These utilities are invaluable in their own right, bringing Macintosh file access, sound sample editing and worthwhile compaction methods to your machine.

Soft Rock Software's *Trellis* brings out the creative element in you, if you fancy building your own text/graphic adventure. Clares' *Rhapsody* allows full music editing on a much greater level than *Maestro* ever did, and Acorn's Clan discs reveal developmental material that never quite made it.

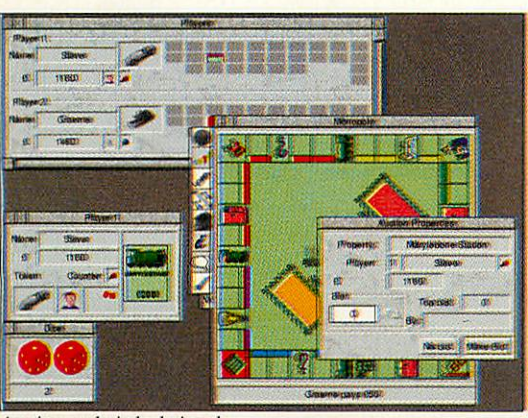
Having looked at the bundled complete software and *Archimedes World* collections, the rest of the disc comprises a vast, sprawling collection of public domain, freeware and shareware programs and resources. There is no indexing system for you to look up and search for an item. Exploration is clearly the key here.



Create molecule diagrams with MoleDraw

To begin with, a complete copy of, arguably, the best text editor around, *Zap v1.42*, is included. The Games directory reveals a selection of playable games, crossing most genres, from classic platformers (*Jet Set Willy*, *Manic Miner*) through to board games (*Battleships*, *Reversi*). The Tom Cooper classic *Gyrinus 2* is also here, as well as a rather nifty pinball simulator. Scientific programs are represented fairly well here. *MoleDraw* is an object-based drawing program for producing diagrams of chemical structures. Bitmap clip-art of all the elements of the Periodic table, plus a graphical database of said elements are among the other scientific resources.

Within the Utilities folder is a copy of the freeware *RealAudio* player, to enable users to harness the ubiquitous audio format now so popular on the Web. Rick Hudson's mature and excellent *SoundCon* allows most industry-standard sound files to be produced from, or converted to, Acorn sound files. If you wish you were able to split large files across Acorn discs, Adam Hamilton's *Split* does the business nicely. The Internet directory revealed the biggest disappointment – no read-only version of *Fresco*®. Instead, the oldest browsers, *Arcweb*, *Webster* (the freeware version), and even, ahem, *Webite* were all that could be found. Thankfully, the software section fares much better. Peter Naulls port of the *GNU Java* source compiler is highly recommended for budding or competent programmers. *POPstar* is a very capable POP3 mail client and *Socketeer* an easy-to-use Internet dial-up program. For lovers of hand-coded HTML, *Validator* is invaluable for checking and cleaning up badly written script.



A unique and nicely designed desktop version of a popular game

It is really unfortunate that a quick skim through the CD is all that can be done within this review, as many of the items justify features in their own right.

The disc is a complete mess in terms of structure, so you will be spending a while rooting around its content: but for content, it is a absolute must for any collection. Great value for money, and with £5 of every sale going to charity, there is no reason why anyone should not purchase this disc. END

Product details

Name:	Kosovo Orphan CD
Price:	£6.75 (includes UK postage, rates may differ for overseas)
Supplier:	Paul F. Johnson, 77 Station Road, Haydock, St. Helens WA11 0JL (or contact APDL, Archive, Clares and CTA Direct)
Tel:	01744 600733
E-mail:	paul@physchem.freeserve.co.uk
Web:	http://www.acornusers.org/charitysite/Kosovo/index.htm

Small networks

Mike Buckingham explains how to get your home network sharing

So, you've got your network physically in place, but nothing is talking yet. Configuring the machine is the second and most difficult step, lots of numbers and new words with definitions you never even dreamed of. What we'll look at first is setting up the PCs – if you have any:

The first thing to do is to set up the correct adapter protocol for your card. For this you need to open up the control panel and double-click on *Network*.

Ensure the Configuration tab is selected and click on *Add*, then highlight the Adapter symbol and click on *Add* again. You are now invited to select a network adapter and you will need to scroll down the list to find yours – or click *Have disc* and install from there. Click on *OK* and the adapter will be installed.

This isn't the end of it though. You must ensure the relevant net protocols are available and internally associated with your card.

To do this, start at the configuration tab again, select *Protocol* and *Add*, select *Microsoft* and click *Add* again. Then add *IPX/SPX*, *NetBEUI* and *TCP/IP*, clicking *OK* to confirm. (You may need your Win95/8 disc during this process so have it handy).

Now from Config select *Service*, *Add*, select *File* and *Printer Sharing for Microsoft Networks* and click *OK* again. Now select *Client*, from the list and add the *Client for Microsoft Networks*.

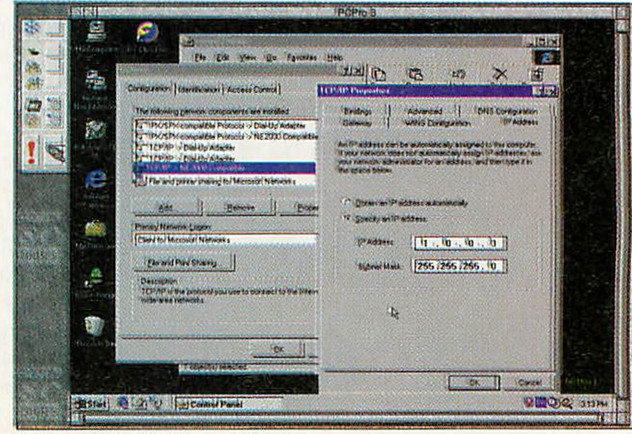
Now you should have *TCP/IP->(your net card)* in the list. Double-click on it and check the Bindings tab. Ensure the check boxes bind your card to the protocols. Now select the *IP Address* tab, select *Manual ID* and fill in the numbers. 1.0.0.x is fine for the IP address where x is a number unique to each machine on your network. Then fill in the mask as 255.255.255.0 – this stays the same for all machines. Now you will need to restart.

Now the Acorn

First off you need to install *Omniclient*. It comes with its own instructions so that's not too tricky. The only problem I had, or thought I had, was that the instructions say to install two files which weren't evident on the disc but which turned up in my boot sequence anyway – put there I believe by *Voyager*.

The network uses software common to other programs using TCP/IP, so if you are connected to the Web you will have these files already. If not, *Browse/RiscCafe* will install them for you as well as updating some parts of *Boot*.

Next you need to configure your machine to run on the network. So double-click on *!Boot* to open the config window and select *Network*. Then click on *Internet* and in the window that opens, tick the 'Enable TCP/IP Protocol Suite' option. Then click on *Interfaces* and tick as indicated. Having done that you can now configure the port as shown – though the last digit in the IP address is your choice and must be unique for each machine on your network. Now click on *Set* and *Close*, and you should be back at the Internet configuration window with the *Routing* symbol on it.



Sorting out the IP address on the PC

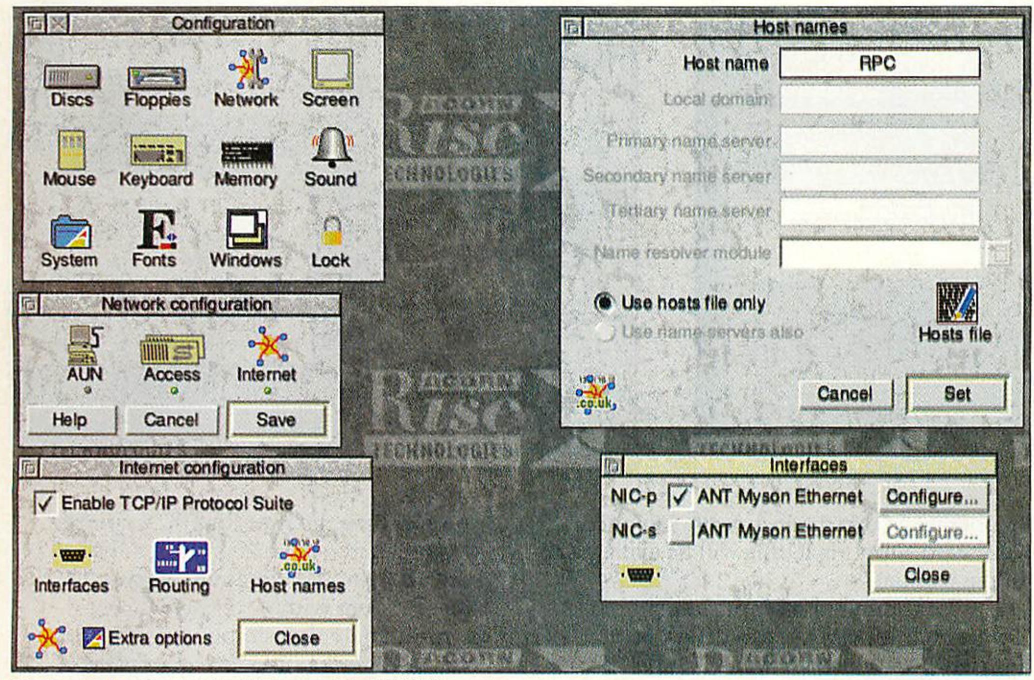
Select that and give your computer a name. *Close* and *Save* as necessary to return to a blank screen and reset the Acorn. When you start up again, you need to set up *Omniclient* using *Omnisetup*.

Pinging

You should now, if all is well, have the rudiments of a network. You can't as yet see files, but the hardware should be able to communicate. Here's how you test for it: Use F12 or a task window to get a command prompt and type *ping 1.0.0.x* where x is the number of another machine – you can ping the machine you're on as well, but that's not necessarily helpful.

Press Return and you should see the results of a successful ping. It means the two machines are communicating so the network is functioning.

On a PC, open a DOS window and type *ping 1.0.0.x* for a test. You can test all connections this way and



Selecting and configuring the Ethernet card in RISC OS

hopefully isolate any problems. If all is well - proceed. If not, you'll have to go back over all the settings and check they are what they should be.

In my system this procedure uncovered a fault with the Risc PC connection, it turned out that the 10base2 segment was neither enabled nor terminated. This was a matter of two switches on the back of the hub: one enabled the 'backbone', in other words the 10base2 port, the other switched in a 50 ohm terminator.

Now connect

Just a few more settings now to get the whole caboodle up and running. On each PC, open up the 'My computer' icon and do a right click on any disc drive you want to share. Select sharing from the menu and then configure as you see fit. As my system is not likely to be messed with, I've not password protected it.

On the Acorn the setup is marginally more complex because PC drives have to be shared via *Omniclient*. You should find the *Omni* network symbol (a vertical PC case) to the right of your drive icons on the iconbar. A menu-click on this will offer a menu that includes Mounts, and from there an option to save mounts. You don't have any, yet – but do a save anyway to create a mounts file you can edit.

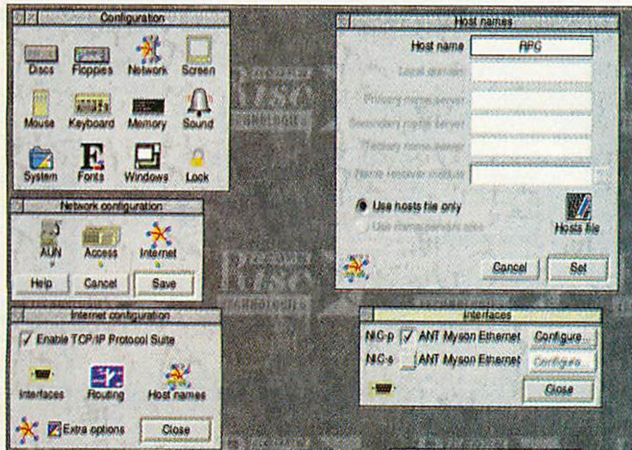
Now return to *!Omni*, shift+double-click to open it, then open the Files directory. There you'll see the mounts file – the one you've just saved. It's empty except for instructions on how to build a mounts list.

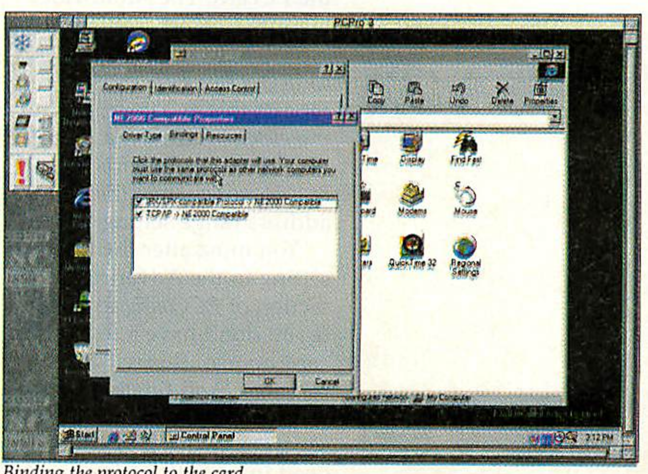
These consist of command lines that define what other drives the machine is to have access to and how to find them, plus any necessary security codes.

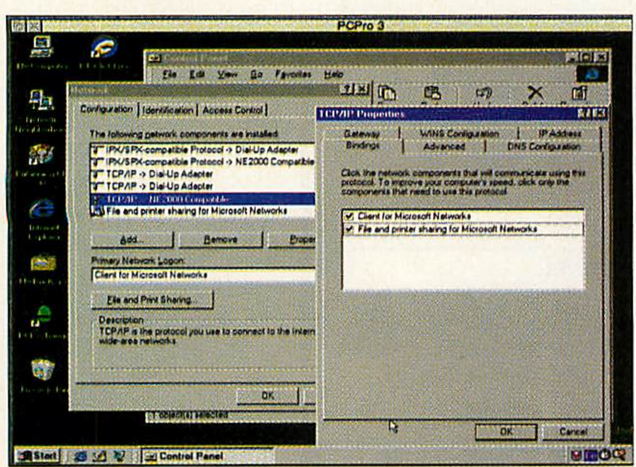
Once that is complete, you can save the file and click on the network icon. If all's well, you'll see the drives to which you are allowed access appear in a window and the iconbar icon(s) will change to suit.

PC card

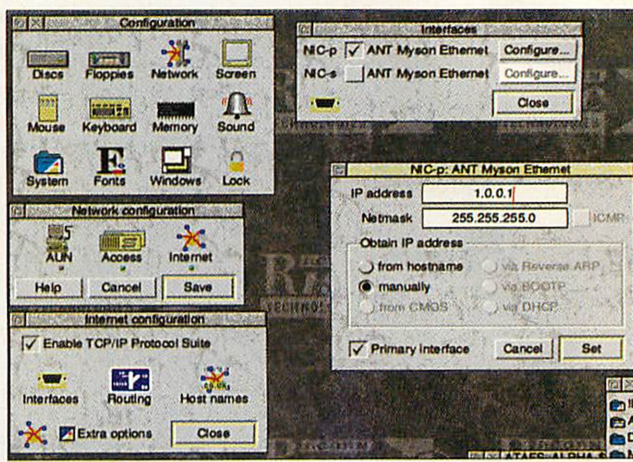
That would be it, unless you have a PC card. Newer network cards can be enabled


Selecting and configuring the Ethernet card on RISC OS


Binding the protocol to the card



Specifying which network software is to use the chosen network protocol



Selecting and configuring the Ethernet card on RISC OS

to operate as two distinct ports: provided your card supports it, this will be explained in the manual.

At the command prompt simply type *Configure EtherX Multiple* where X is the Ethernet module letter. Mine is EtherM but if you are not sure type *RomModules* at the command line and you should get a long list of installed modules. Right near the bottom will be an active module called ether-something. You will also see it is associated with your Ethernet card/podule.

That's the one you need to use. You can also check if it works at the command line – type EXinfo after the * and you should get a listing for each port. You will also need either a version of *PCPro* with network links built in or the add-on disc. The former is simpler to deal with but either should work and Aleph1 can supply both.

You will still need to go through the process of setting up Windows for networking using the settings shown for Novell, as this is the driver supported by Aleph's NetLinks. Much of the setup is identical to setting up a regular PC, as you might expect. There are some differences though, and I did run into a major problem that messed things up for a while because I wasn't prepared for it. The network adapter uses IRQ 5, as does the Atomwide fast serial card port 1 which is mapped to COM2 in the PCcard. The Atomwide manual suggests setting the Novell network card driver to IRQ 8 but my system reports this as a conflict with the clock. It turns out that IRQ 12 works fine for me, but do not change the I/O address range setting.

You must alter the IRQ setting in the Advanced section of *PCConfig* to match, if you don't have a fast serial card none of this will be a problem. And finally don't forget the PC card is a separate device and will need its own IP address – it doesn't share the host Risc PC's number.

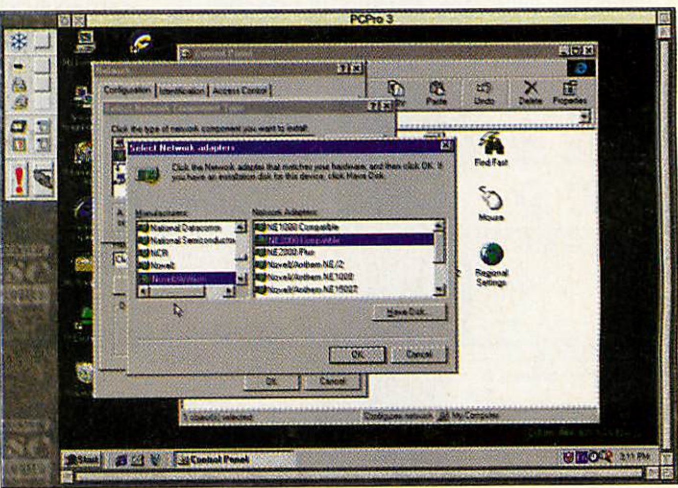
Now that your card is also on the network, you will no doubt attempt to access it from within RISC OS. Unfortunately that simply doesn't work, even though the ping tests work fine. I presume this is because although the network card software allows two separate addresses it isn't clever enough to do two things at once and talk to itself.

Conclusion

Whether a small network like this is worth the effort is almost entirely up to the demands you place on your hardware. I'm finding it a novel experience being able to access other hardware in my home office, and it does open up some new possibilities.

While I can't direct a PC's print stream to the Acorn-hosted printer, I can open up a PC-resident Fireworkz file in the Risc PC and either print it or work on it as needed. PC-only formats like Word can be similarly loaded into PC-card resident software and printing accessed from there.

A few years ago when hardware was considerably more expensive, a network on this scale wouldn't have been viable. Now that the cost is relatively low, I reckon it's worth it. And the kids are looking forward to playing games across the network. Me? I wouldn't do that. END



Configuring the PC card for network connection



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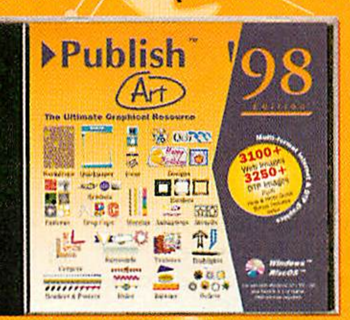
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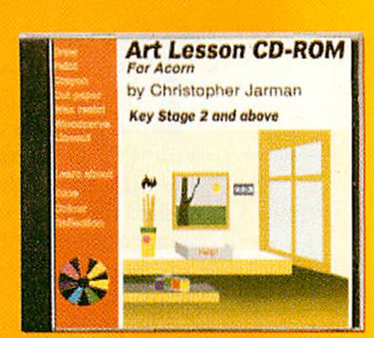
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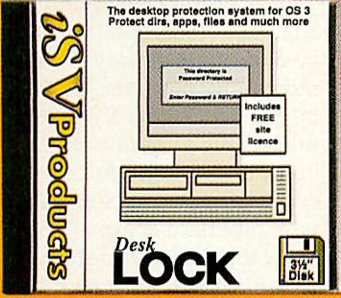
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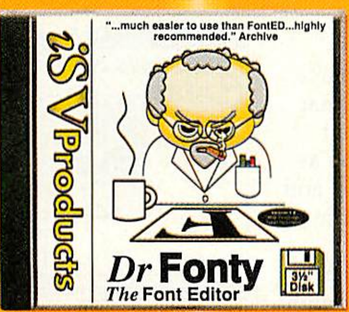
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(re-) Touching photos r

The first two parts of this series have covered ways of altering images using only the applications which come free with RISC OS computers.

At the end of the last episode I wished for an airbrush – well I can't manage anything brilliant for free, but I hope this month's offering comes close.

The problem with sticking sprites on top of each other is that you can always see the join. On the cover disc is a small program which manages, to some extent, to hide these joins.

Basically the *Scatter* app takes single pixels from just under the pointer tip and pastes them somewhere else as decided by the option settings. The aim is that the facilities provided should allow you to find the best settings for your particular needs. Just waggle the mouse over the join (while pressing Adjust) – it can be muddled up quite nicely with a bit of practice.

Each of the *Scatter* techniques here avoid the problems posed by the different colour rendering systems (as used in different screen modes) by simply ignoring the colour of the pixels entirely and moving them whole-hog. A better method would be that which is used in packages you pay for, like *Photodesk*, where a real blend is made between adjacent colours – anti-aliasing as it's called.

There is a way we can do this on the cheap though, it's not as fast and the results aren't as good as with a proper setup, but it's free. The trick is to use *ChangeFSI*. My thanks to Rick Murray for pointing this out after reading the first part of this series. I've mentioned *ChangeFSI* a lot so far, and yet it has another facility left in its bag of free tricks, but you have to work a bit to use this one to best advantage.

Scaling options
Ignore source pixel size
Ignore pixel aspect
Lock picture aspect
Scale to fill 1024 by 768
Scale 1:1 1:1 · Custom
Scale 1:1 1:2 · x 2 : 1
Scale 1:2 1:1
Scale 1:2 1:2 · y 1 : 1
Rotate · +90 · -90
Mirror L/R · Mirror U/D

Fig I: ChangeFSI's scaling box options

More features

The idea is to use the 'Scaling' feature to effectively interpolate and add new pixels at the junctions between two bits of a mis-matching sprite or otherwise hard edged picture. It may be helpful to refer to last month's article from time to time from here on as I will not re-describe the old methods in depth.

Stage one is find the join. Take a *Paint* type snap of it and drop the new sprite into a temporary store, like a RAM disc (which is what I always do anyway). Then, fire up *ChangeFSI* and set the scaling so that the X direction is doubled and the Y is left alone.

Also set the Rotation to 90 degrees and enable it, then ensure that the sprite output mode is as good as the input sprite, and process the sprite for a first pass.

Save this step, then pass it through *ChangeFSI* again without altering the settings (using the Reprocess option will not do what we want by the way).

After the second pass the image will be twice the size it was in both dimensions and will be upside down. Now save this step again and change the scaling in *ChangeFSI* so that it halves the X size, and do another two passes. This will bring everything back the right way round and restore the size. Any edges, and for that matter any detail, in the sprite will now be blurred, but the colours will remain correct, as will the overall size.

Now when you paste the processed sprite part back on top of the original image (using last month's *Draw* methods) it will fit seamlessly, but the old sprite join buried within it will be fluffy. Simply running the entire image through this process could well run out of memory and would also reduce the quality of the whole picture, which is undesirable.

Figure I shows the settings for the scaling box options in version 1.15 of *ChangeFSI*. Unfortunately this technique only works on machines capable of greater than 256 colours. Another trick you can do is to make the blur greater by increasing the magnification, it only works at times two, and only in the X direction, hence the need for rotation.

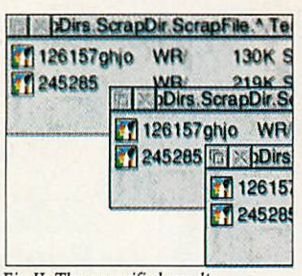


Fig II: The magnified results of none, one and two full cycles

This process may sound a tad laborious, but it can be done quite quickly. For a more fluffy outcome, do it more often. Figure II shows the magnified results of none, one and two full cycles using a source sprite with nice hard edges to show it up. This also shows why it's best to only alter the small section of the picture which needs it.

Scatter

Back to *Scatter* – hardly a fine artist's tool, but when added to the blur provided by the above technique all joins can now be rendered invisible. Well most of them anyway. Figure III shows the effect of the tool on thin and thick black lines created in *Draw*.

By doing this I point out a shortcoming of this app – that it paints on to the desktop screen in such a way that if the screen is updated the tool's work is lost. This

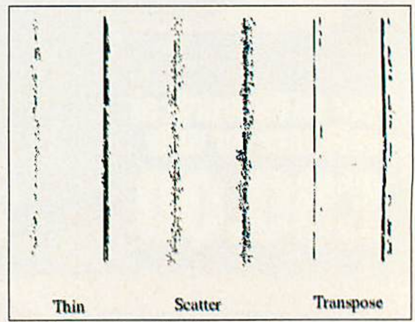


Fig III: The effect of Scatter on thin and thick black lines created in Draw

Simon Anthony rounds off his series on photo retouching for free

evisited



Fig IV: The first steps of the new picture

problem can be put to our advantage by allowing a sort of 'undo': by dragging a small window over a bit that didn't work you can have another go, leaving the rest of your work untouched (but still vulnerable).

Saving the work for posterity is easy enough as long as you take precautions. I've built a screen grabber into *Scatter* for this purpose. By clicking on the 'Start Crop' item in its menu you can Select-click to mark one corner and Adjust-click to mark one diagonally opposite – a box will be drawn between the two points to enclose the grabbed rectangle.

While a crop box is being displayed nothing else can be done, this is to protect the delicate work. You can reposition the corners as much as you like before pressing Return. This will do the job of making a sprite and automatically saving it into a temporary store in your Scrap directory – which will then be opened for your easy access. The file name is derived from the system time and so will (nearly) always be different. This way multiple snaps can be taken without fear of losing an earlier one – although you have to keep tabs on what is what.

You can use *Paint's* snapshot facility to grab your work, though the problem there is that you can never be sure just where the control window may pop up, like as not it will be right on top of the work you have just done – and will wipe it out.







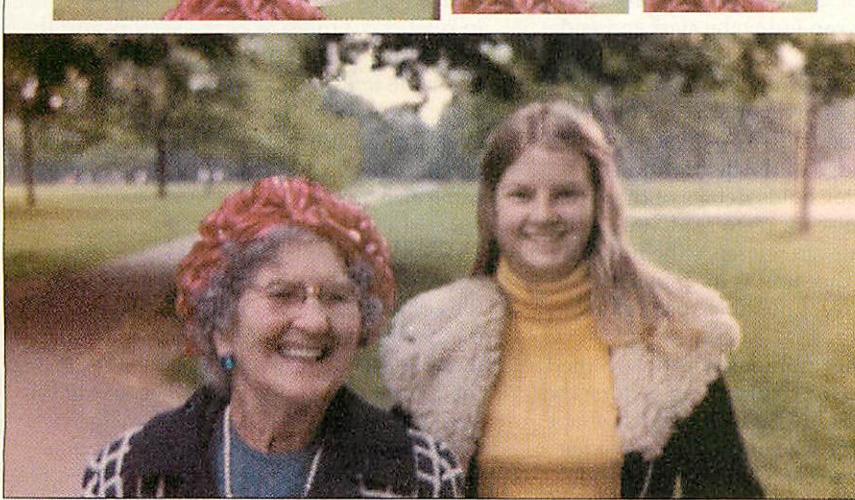


Fig V: The final image plus the blurring stages which made it up

What can be done

The original picture from three months ago, which I have been working on, had one more problem which I didn't notice at the time I took it.

There is a large tree growing out of my Great Grandmother's head. Better shift it. A mixture of techniques is required if you are going to do it for nothing, the first is to replicate some foliage from the existing background.

Manipulate it so that it pastes over the tree but this time don't worry too much about the edges. Just try not to make any colossal black-white straight line transitions as it is asking too much of anything to mask them out completely. Figure IV shows the first steps, starting with the end product from last month.

Quite a patchwork had to be made up from bits that look as if they would do the job – see last month for how that was done. The aim was to only have very slight colour differences at the edges, *Scatter* scattered the pixels around, and in some places that was good enough as it turned out, but in others the *ChangeFSI* trick was needed to blur out the dots.

Figure V shows the final product plus the blurring stages which made it up – note the lack of tree in hat. If I had taken longer then it would look better, but better tools are the best solution. There is a chance I may show how that is done too, if I get some better tools to play with that is... END

Contacting me

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When more is less

Simon Anthony makes the best use of his resources

When my parents first moved home they had so much stuff they thought they would have to use a large removal van. When it came to it all their worldly goods fitted in the space above the driver's cab. Somehow though, once it was all unpacked in to the new house the relatively massive rooms were immediately filled. Odd.

Believe it or not computers have the same problem. This article will show that files expand to fill the space available, well, not the files themselves but the space they take up. This is an unfortunate fact of life and all too real when it comes to moving in to a new harddisc.

Problems

Efficiency in packing is the key to the problem. In the initial days of computing it was realised that some sort of compromise was needed to cater for the two main requirements of a storage system – raw size of storage space and the speed and ease of access to its contents; our problem is due to this compromise.

The following description is as clear a way as I can manage to describe the problem. Simply put, the disc is divided into *sectors* that can be tightly packed and easily found.

As each sector is the same size a co-ordinate system can index the start and end of each one.

The disc is also divided into *zones* which contain the sectors in a pattern held in a *map*. This map is stored halfway between the centre and the edge of the disc for quick access. A file index holds details of the actual contents of the disc for us to read, it uses the map's co-ordinates to reference the files. The smallest usable disc unit is its *granularity*, this defines the least possible space a file can take up.

The size of this granularity is determined by the larger of two contributing factors; the size of the sectors in to which the disc shape is divided and the size of the *File Allocation Unit*, both of these can change with the disc size, manufacturer and the disc's method of formatting; hence this granularity is known as the *LFAU*, the Large FAU.

Sector size is fixed by the manufacturer of any disc but mileage may vary, most often it's 512 bytes. This is the smallest space any file can take up under any circumstances as each sector can only hold one file or part of a file. So even a 1 byte file takes up 512 bytes by itself. A 512-byte file takes up all of one sector (on – harddiscs formatted to that) but a single 513 byte file uses 1024 bytes – two sectors. This means 511 bytes are lost through 'sector rounding'.

In most situations though the FAU is larger than the sector size, so the smallest space that a file will occupy is determined by that. The size of the sectors can't be changed, but the LFAU still can as it is part of the way the map has been written; although this can't be done directly – read on.

As drives get larger, the size of the granularity increases with it. It is, in the time honoured phrase, 'out of the scope of this article' to explain exactly why, but it is also true of PCs of any make (although things are improving for us with RISC OS 4 and also in the non-Acorn world with NT/FAT32 systems).

While each file must have at least one allocation unit assigned to it, more than one file can be in one unit, if the sector size *will* allow it to fit that is. Thus the efficiency of data storage depends on the size of the files in relation to the size of the sectors and the FAU – the granularity. As files are never all the same length this makes working out free disc space, in terms of files stored, hard, even for the computer. There would be no problem or wasted space if all files were the same size as the LFAU.

Acorns can't count

Start with an empty disc, then save some files of known length into it, then see if the maths of free space and known file length make sense. They won't. The bigger the disc, the more they won't. This is because of the size of the gaps.

There are two sorts of gaps where file storage space can be lost; those where a file does not fill a sector – sector rounding – and those where a file, or set of files (often a

directory containing files) doesn't fill an LFAU – wasted sectors. Files can only share a LFAU if they are in the same directory.

The Acorn 'Count' system reads the stated length of a file from the index, it doesn't even notice, let alone count directories and so will not and cannot show how much space is required to store them. It can only be a guide to what is going on on your disc.

The 'Free Space' facility from the filing systems' iconbar menu can say that a disc is totally filled with empty (nested) directories while Count will say it is empty because there are no files there.

Directory problems

There's a bit more to say about directories, for some odd reason each one takes up the LFAU*16 times as much space as you would expect, (it is something to do with the way it is mapped) but the extra space can be filled with files. Once this has been done then the space filled by the directory expands to the next multiple of LFAU*16. So adding just one byte can use up 32Kb (or 64Kb) more actual space.

As you will expect by now, this problem gets worse the larger the disc, and hence the LFAU, becomes. So, lots of empty directories use up very great amounts of space. Got all that? Even if you haven't you are still affected by it.

See for yourself

At this point I must introduce a freeware program which I hope is on the cover disc this month. It is quite

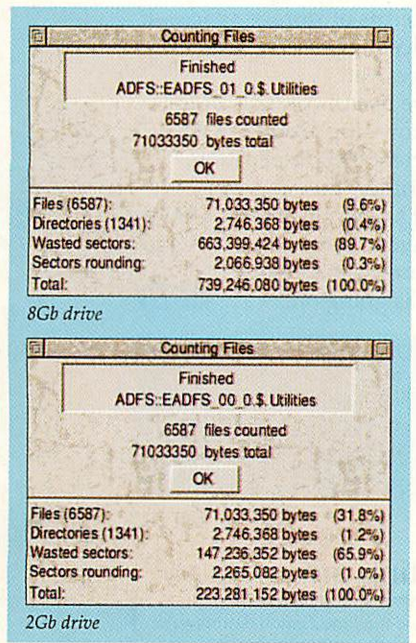


Figure I: The real price you pay

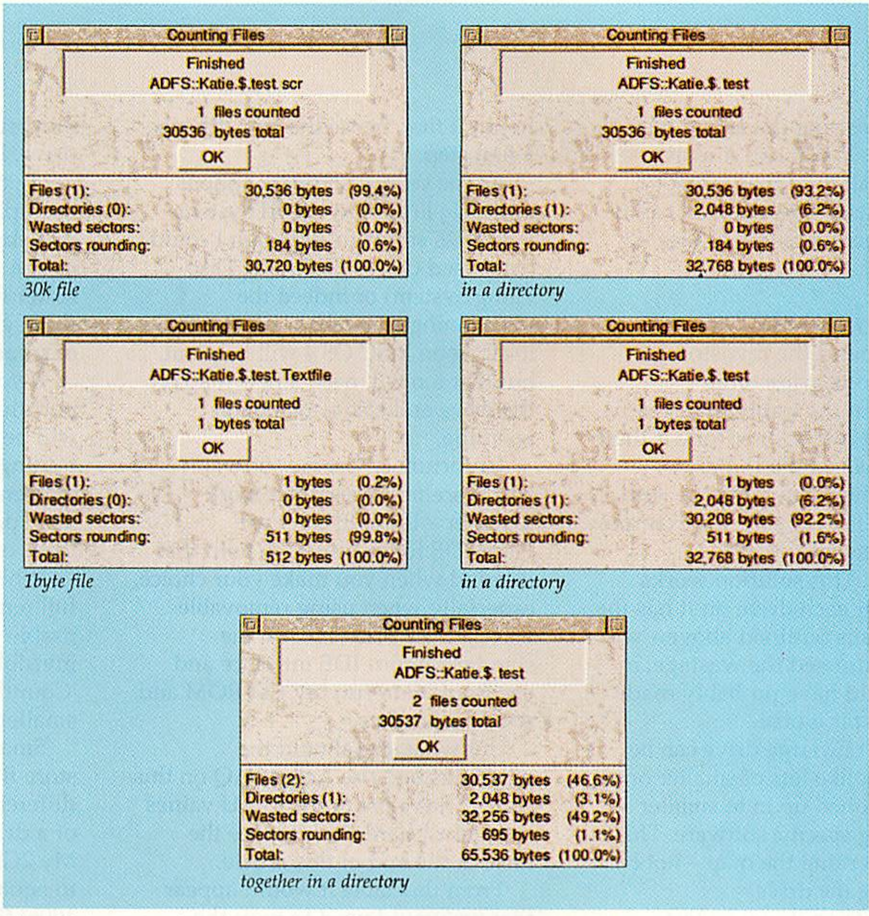


Figure II: Comparing the real space taken by files

old now, but so is a lot of frequently used and splendid RISC OS software. *RealCount* by Sergio Monesi shows up the problems very clearly – but working out just what all the figures it produces mean is yet again not simple. The screen shots show the output from *RealCount*.

The combination of the effects described above is truly dramatic and yet without the aid of *RealCount* utterly invisible to the computer user – until it's too late.

My experiments have shown that the amount of loss can halve if the drive size is halved. This is worrying as that means it also doubles with a similar increase in size.

A 2Gb drive can, under certain conditions, only store as much as a 1Gb drive. I had a 3Gb drive which had run out of free space so I bought a big, new, off the shelf, PC 8.6Gb harddisc. I formatted it using Acorn's *HForm* application and then (quite a few hours later) transferred all my files across to it. The new drive was almost totally filled! The LFAU was now at at least 32Kb and 90% of my new drive was lost space – this was certainly not worth the cost and considerable effort in getting and setting up a new drive.

Figure II shows a real world example. My utilities directory is shown first as it was on an 8.4Gb drive and then again on a 2Gb drive – shocking I would say.

An odd side-effect of these gaps is that a full disc can sometimes hold more files. Under more normal circumstances if a small file, which could fit in to a gap at the end of a LFAU, was moved from somewhere else on the disc then the total storage space would fall according to Free Space, while the amount of data stored according to Count would stay the same (though it may be harder and therefore slower to find and use the file). Figure III shows this effect.

Solutions

So, use as many small drives as you can, have a mixture of large and small files on each and don't have many directories. It would work, and has done for over a decade on Acorn computers, but it is impractical in these days of very large storage demand. An option is to use an archiving system which treats a group of files and directories as just one file.

This can remove most of the wastage within itself, but just one read-error will lose the whole archived set and also accessing the files can be slower (I am not talking

about compressing the actual files' length here). *X-files* and massive *ArcFS* files fall in to that category, they have a valuable role, but rapid and secure access to lots of files is not it.

Practical answers

One way around the raw storage problem is to provide more harddiscs, but the traditional Acorn can only run two at once (one if there is a CD-ROM installed). But hardware which can interface with more drives is available, for example the RapIDE system from Yellowstone. This solution works very well but each drive on it has the same problems outlined above – we have not addressed the wastage, in fact we would have probably made the problem far worse.

However one large drive can be made to look like lots of smaller ones if it is partitioned up in to smaller chunks using specific software. This is done by re-writing the map – not by re-formatting the drive.

All the data on it will be lost though so you will need somewhere to put it first, hence the new drive as a first step.

Of the several software options available I chose to use ALSystems *PowerIDE* software, although I could have used Clares *BDFS* (Big Disc Filing System) or indeed the partitioning software of the RapIDE itself. Soon RISC OS 4 will help out, but that too will need a new map on the drive and also a total data reshuffle.

Unfortunately some software/hardware mixtures don't work together – RapIDE can't use *PowerIDE* for example, so hold that in mind when you make your choice, especially when using removable drives. I use *PowerIDE* on the standard Acorn IDE interface and use RapIDE to run my CD-ROM and removable drive.

But what size should the partitions be? The Acorn FAQ on this subject has a list of the LFAU values set against harddisc size, see the table at the end of this article.

From this table it would appear that we would need to keep the harddisc size below 500Mb to get the most storage space per quoted size of drive. But, some files are always going to be big. Graphics for example can take up tens of megabytes per file, in fact any file over a few hundred kilobytes will suffer far less from the LFAU than those generated by the storage of lots of small e-mail or news files.

If you store large files in one partition set with a higher LFAU you will be able to get at it quickly by trading off individual file space efficiency against speed – and it will keep down the number of drive icons on the iconbar.

When such a drive claims to be full remember there will still be some usable gaps left which, although invisible to the normal Acorn 'Count', could be filled by files smaller than the LFAU.

Small changes in the way you store files can make a huge difference. Getting the partition size of a drive right is very important. My 2Gb drive would divide well in to equal halves, the actual size being 1006Mb.

Here every megabyte matters, not in terms of raw storage space but in how it effects the LFAU. Make a partition 999Mb and the LFAU is 64Kb, at 998 it is 32Kb, so it is no loss to leave out even a few tens of megabytes when cutting up the drive.

My 2Gbs are now on the iconbar as four partitions, two at 499Mb, one at 998Mb and one at a mere 18Mb.

My Utilities directory is now in the 988Mb partition and is over 60% efficient in terms of storage space – I haven't noticed any access speed disadvantages yet.

The entire useful contents of my 2Gb drive now slop around in a doubly efficient 998Mb partition, leaving the other three drives totally empty. That saved me at least £100 – but I did have to pay for the software and it took me ages to work out what was going on. END

LFAU	Disc size	Space used
1Kb	499Mb	16Kb
2Kb	998Mb	32Kb
4Kb	1996Mb	64Kb
8Kb	3992Mb	128Kb

Counting Files
Finished
ADFS::Katie.$.SEMERC
11728 files counted
97598230 bytes total
OK

Files (11728):	97,598,230 bytes	(57.8%)
Directories (2355):	4,823,040 bytes	(2.9%)
Wasted sectors:	62,794,752 bytes	(37.2%)
Sectors rounding:	3,541,226 bytes	(2.1%)
Total:	168,757,248 bytes	(100.0%)

812Mb drive

Counting Files
Finished
ADFS::Rose.$.SEMERC
11728 files counted
97598230 bytes total
OK

Files (11728):	97,598,230 bytes	(41.5%)
Directories (2355):	4,823,040 bytes	(2.1%)
Wasted sectors:	128,946,176 bytes	(54.9%)
Sectors rounding:	3,591,402 bytes	(1.5%)
Total:	234,958,848 bytes	(100.0%)

1006Mb partition

Counting Files
Finished
ADFS::Katie.$.test
0 files counted
0 bytes total
OK

Files (0):	0 bytes	(0.0%)
Directories (1):	2,048 bytes	(6.2%)
Wasted sectors:	30,720 bytes	(93.7%)
Sectors rounding:	0 bytes	(0.0%)
Total:	32,768 bytes	(100.0%)

812Mb drive

Counting Files
Finished
ADFS::Rose.$.test
0 files counted
0 bytes total
OK

Files (0):	0 bytes	(0.0%)
Directories (1):	2,048 bytes	(3.1%)
Wasted sectors:	63,488 bytes	(96.9%)
Sectors rounding:	0 bytes	(0.0%)
Total:	65,536 bytes	(100.0%)

1006Mb partition

Counting Files
Finished
ADFS::Katie.$.test
3 files counted
29884 bytes total
OK

Files (3):	29,884 bytes	(91.2%)
Directories (1):	2,048 bytes	(6.2%)
Wasted sectors:	0 bytes	(0.0%)
Sectors rounding:	836 bytes	(2.6%)
Total:	32,768 bytes	(100.0%)

invisible space in a directory

Fig III: Using the invisible space

Contacting me

You can e-mail me, Simon Anthony, at sranthony@innotts.co.uk

RISC OS 4 away

Dunstan Orchard reports

On Thursday, 1 July 1999, RISCOS Ltd successfully launched, on time, a new operating system RISC OS 4. This will be incorporated in newly designed computers such as the RiscStation 7500, the Micro from Microdigital, as an option on CTL's latest Risc PCs and as an upgrade for existing Acorn A7000, A7000+ and Risc PC computers. The upgrade is priced at just £120 and is available from dealers or, post free, direct from RISCOS Ltd at 3 Clarendon Road, Cyncoed, Cardiff, CF23 9JD.

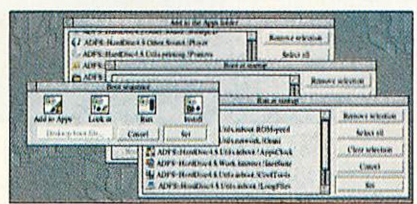
So, what do you get for your money? Well the key features of RISC OS 4 which have been plugged here there and everywhere are:

- Great increase in speed
- Fully Millennium compliant
- Support for hard discs up to 256Gb
- Long filenames facilitating cross-platform operations
- Boot system implementing drag and drop
- Advanced Configure tool
- Sophisticated Pinboard
- Security features
- Compatibility with earlier software
- Bundled commercial software

Other people have noted the 40%-ish increase in speed which means, compared to un-upgraded SA Risc PC, the upgraded ones are the equivalent of a 300MHz machine, and the speed improvements even apply to single-tasking games. Which is weird.

Fully millennium-compliant? Well, there is one OS routine which isn't, but hardly any software uses it – and, compared to a certain other brand we could mention, that is 100% compliant.

Big hard discs? We haven't had this one converted to the new format so we don't know what the saving is but some people have reported

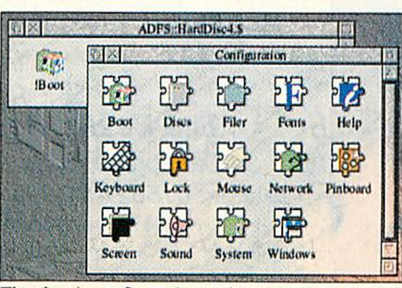


Setting up your Boot sequence

saving as much as 500Mb transferring their data from one big disc to one even bigger (which should have caused more wastage, not less). And you get long filenames but even better you can rename files in the Filer window.

The drag'n'drop Boot configure is cool. No more messing with typing in paths and stuff. Excellent. And the new plug-in Configure app is neat though it doesn't grab you by the throat.

The new Pinboard uses some of the features to be found in other applications so that different types of icons "gravitate" to different parts of the screen. I miss the ability to use the patch that lets me save files to the backdrop – but I can save to directly on to harddisc icons now. Almost as good, but that's just down to what I'm used to. RISC OS Ltd said that some improvements are easier to incorporate than others which is why some changes are there and some aren't.



The plug-in configuration options

Weird thing: RISC OS 4 can now put an "iconise" button on the title bar, next to the maximise/minimise icon, just like PC windows.

But all the machines I've seen have it switched off (it's configurable), to be honest it's just as simple Shift+clicking the close icon. END

Bundled Software

You'll be totally surprised at how much bundled software comes with RISC OS 4 – and that's before any software you get with any new machine you buy:

- *!Writer* supplements *!Edit*, from the authors of *!Easiwriter* and *!Techwriter*, file-compatible but with none of the frills, for producing properly formatted letters and documents;
- *!Vector*, a very powerful drawing package which is like *Draw* and loads/saves drawfiles;
- *!Organizer* to help organise your life and keep track of diary, alarms and addresses;
- *!ImageFS* to transparently convert between RISC OS and PC and Mac graphics formats;
- *!Taborca* which allows the generation of PDF (Portable Document Format) files from RISC OS files, that can be ported to a PC or Mac;
- PhotoDisc image library in a series of resolutions, suitable for screen display or high quality printing.

Monitors

Iiyama 15" 350	£145.00
Iiyama 17" (S702GT) .28dot	£279.00
Iiyama 17" 400 Pro .25 dot	£359.00
CTX 14" Digital Scan	£125.00
CTX 15" Digital Scan	£145.00
CTX 17".28 70Khz Digital	£259.00

CTX mons have (3 year on-site warrty)
Many other models available

Switch Boxes

Parallel 2 way (25w 'D' skts)	£16.99
Parallel 4 way (25w 'D' skts)	£19.99
Serial 2 way (9w 'D' skts)	£19.99
Monitor+Keyboard 2 way	£19.99

Suitable cables and other boxes available, please ask

VGA to PAL TV Converter



The VGA Converter allows the output of any Acorn running in a VGA or SVGA mode (or PC comp) to be displayed on a TV or recorded onto a video recorder. Please ask for more information.

Price £159.00 inc vat

Colour Printers



Epson Stylus Colour 440	£125.00
Epson Stylus Colour 640	£159.00
Epson Stylus Colour 850	£279.00
HP Laserjet 1100 (laser mono)	£289.00

Virus Protection

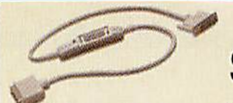
Pineapples Virus Protection Scheme has been running for over six years and is still being updated with new viruses on a regular basis. New software versions are sent out to members every four months and the total number of viruses which can be removed is well over 200. The latest version is now scanning at up to four times faster than previous versions despite coping with many more viruses.

Joining fee just £28.20

'If you're interested in virus protection, join the Pineapple Virus Protection scheme and buy Killer. Accept no alternative - 'Acorn User Feb 96

Inexpensive multi-user licences

Parallel to SCSI adapter



A brand new product from Pineapple providing an inexpensive alternative to a SCSI card when using SCSI scanners. The SCSI adapter plugs into the parallel port (with a 'through' printer connector), and can be used directly with SCSI scanners. Works with A3010/3020/4000/5000/A7000/RiscPC (inc StrongARM).

Price just £59.00 inc vat

Colour Scanners

The new Epson GT7000 is great value and the Photo version with transparency adapter gives excellent quality on both transparencies and negatives. Our new SCSI parallel port adapter cable makes this excellent scanner very affordable. The Plustek 9636T parallel port scanner also gives excellent quality with built in transparency-adapter. All scanner prices include Imagemaster and Twain software.

Epson GT7000 - SCSI	**£259.00**
Epson GT7000 Photo - SCSI	**£299.00**
Plustek 9636P - Parallel Port	**£139.00**
Plustek 9636T - Parallel Port (with transparency adapter)	**£189.00**

Pineapple Software

352 Green Lane, ILFORD
Essex IG3 9JS
Tel 0181 599 1476 Fax 0181 598 2343
email:- sales@pineaple.demon.co.uk
www:- http://www.pineaple.demon.co.uk

Terms:- All prices *include* 17.5% vat. Carriage £5 on most hardware. Small items £3 (or less). Phone for quote outside UK. Official orders, cheques and all major credit cards accepted at no extra charge.

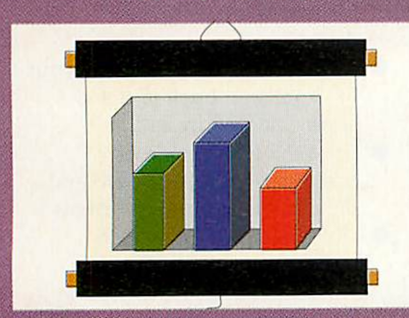
Studio24Pro

'Many Acorn User front covers have been created from scratch using this program alone, concrete proof of the power of this creative tool' - *Acorn User Mar96*

New low price - £59.00 inc vat

NoticeBoard *Professional*

NoticeBoard Pro is one of the most advanced programs for creating and running stand-alone rolling displays and slideshow presentations on RISC OS computers



Single user: £37.00
Site licence: £110

NoticeBoard Pro is a powerful yet easy to use design and presentation system that will run on all RISC OS computers from 3.10 up.

▲ Programs can be created using Sprites, ArtWorks, Drawfiles, JPEGs and the new Cerilica Vantage program, and you can add sound!

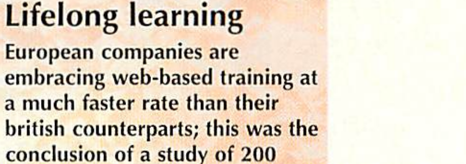
▲ The many in-built features give complete control over presentations, including forward and backward slide movement in slideshow programs, and production of stand-alone programs to run on other computers and with digital projectors.

NoticeBoard Pro enables you to present a series of pictures and/or words with automatic or user-controlled time delay between slides. Its many uses include:

▲ Product promotion at Exhibitions, etc. ▲ School Open Day presentations and other special events ▲ Information points in Offices, Libraries, Schools and other locations ▲ Fund-raising activities

The only limits are the size of your hard drive and your imagination!

The Really Good Software Company
39 Carisbroke Road, Harpenden, Herts UK AL5 5QS
Tel/Fax: 01582 761 395 E-mail: sales.rgsc@argonet.co.uk
No VAT. Post & packing for UK and Europe add £1.50
Other countries £5.00



Web support

That panacea of educational problems large and small, the World Wide Web, has had a number of boosts recently: The Government is about to open a multilingual Website for parents, with guidance about school-related topics ranging from homework to Literacy and Numeracy Hours to wearing uniforms.



All you need to do is enter the age of the child and relevant pages will be offered. In a move to cut down on paperwork received by schools, the Electronic Communications with Schools (EASEA) pilot project, which was testing whether paper-based administrative communications could be replaced by electronic methods, is about to report on its findings. Although, initially, 20 schools in Gloucestershire were involved, any school in England or Wales could join in, and 700 signed up.

They received a monthly e-mail telling them what new documents had been posted on to the Website, which they could access online or download complete with indications about who should take action and deadlines.

Finally, the Times Education Supplement has launched an ISP called *Learnfree* for students, parents and teachers with educational software reviews compiled by the Parents Information Network. To find out more, access www.learnfree.co.uk or call 0845 3000 645 for a CD-ROM and free user guide.

Web watching

Food and farming

Based at the National Agricultural Centre, Stoneleigh, Warwickshire, this site provides teachers and pupils with a range of information on farming, food and the countryside. Funded by all sectors of the industry, from trade associations to unions, show societies to the Country Landowners Association. As well as a teachers guide to over 400 resources there is a list of 800 farms that schools can visit, help on organising farm visits, and fact sheets on such things as farm livestock and biotechnology.

www.cla.org.uk/ffes

Constants and Equations

These pages are a growing reference resource for science, maths and astronomy. The 1700 pages have been designed entirely on a Risc PC using *Draw* for the diagrams and *Formulix* for the equations.

The science section features lists of over 200 constants and 300 equations, periodic tables and a new subjects section for all things to do with physics, chemistry and biology – all with annotations and explanations.

A new feature is the conversions between many hundreds of bizarre and obscure units, although you will need a JavaScript-capable browser for them to work.

Moving on: the maths section consists of over 250 links to pages which describe particular features of maths (circles, pi, fractions, and so on) and is growing at the rate of 30-40 pages a week.

There are also algebraic and trigonometric identities, calculus and a number of tables including addition, multiplication, logarithms and base-n conversions.

Finally the astronomy section features a list of constellations and details on every single planet and satellite of our solar system, including the newly discovered moon of Uranus, verified in May 1999.

Creator Jonathan Stott is looking for knowledgeable people who are interested in physics or maths – whether as teacher or student – to take up partial editing of sections of the site.

http://tcaep.co.uk/

In brief

Lifelong learning

European companies are embracing web-based training at a much faster rate than their british counterparts; this was the conclusion of a study of 200 British and European institutions' attitudes towards training. Yet, Internet take-up is much greater in Britain than much of Europe.

This slow take-up of Web-based training (WBT) is starting to raise concerns that the UK may soon face a skills shortage as companies are slow to invest in new technologies for training. One reason for this appears to be that the corporate need to form committees and sub-committees delays decisions for months if not years.

Music lessons

Essential background information on the lives and times of some of the world's greatest composers can be found on a new CD-ROM from AVP (01291 625439). *Lives of the Great Composers* costs £69 and features 11 composers on one CD-ROM: J S Bach, Handel, Mozart, Haydn, Chopin, Beethoven, Wagner, Berlioz, Brahms, Tchaikovsky and Verdi. It is only available for the PC at present, but AVP are working on HTML versions of *all* their titles so RISC OS users will soon be able to access this and a number of other programs as long as they have a Web browser.

Kid power

Parents and teachers often bemoan the fact that children don't come with a manual. Well Psychic Frog are about to release *The Definitive Guide to Kids.* Based on interviews and questionnaires with thousands of parents, it includes a photographic timeline showing child development from 0 to 6-years and information on what to expect throughout these years. Questions such as *How do I get him to sleep?* are answered by parents' experiences, not by 'expert' opinion. The cost is £29.99

Product details

Contact me Pam Turnbull at educ@acornuser.com

What's the time, Mister Wolf?

It's time to have a bit more help with telling the time. Pam Turnbull reports

You don't have to use or even be familiar with the Numbertime Time BBC Schools TV series to use *Numbertime Time* as it stands on its own. Featuring Bill the Bird and Bernie the Cat, it consists of six activities of varying difficulty which can be accessed in any order.

Bernie is always on hand with help and instructions (written and spoken) that are simple and to the point, as children look at the concepts of time as well as start to work with analogue clocks. Just move the mouse over the six pictures of the main menu screen to hear what each activity is about.

First, second, third, last, as you can tell from the title, deals with the sequencing and ordering of events from Bill's life. Using everyday occurrences such as getting up in the morning these are familiar to most children but lead to lots of discussion of just when you brush your teeth and why! The first picture has to be dragged into position before the others can be added and as well as helping with the sequencing of stories it reinforces knowledge and use of ordinal numbers.

Even more discussion (and argument) came from *Bill's day*. In the middle of the screen is a picture of Bill doing something such as going to school or looking out of his window. Children then have to click on the morning, afternoon or evening picture.

However, some of these are questionable, for instance is reading a comic on your bed really time of day related? This is part of the design and discussion, and is one of the development suggestions presented in the manual.

The language of time is further covered in *Bill and Bernie racing home* where the two characters take part in a sprint race. When they've finished two sentences appear using comparative language: quicker, slower, faster, before, after, sooner and later. The children must click on the correct sentence.

Activities can be stopped at any time though there is an end point when children are given the opportunity to play again or choose a different game.

Choose the right season puts Bill centre screen carrying Easter Eggs or dressed for summer. These clues give you the information needed to drag him to the right season box. This again led my group into some 'words' about which season was best for kite flying and how you sometimes wore a scarf in the Spring because it was cold then too!

The final two activities introduce children to the analogue clock. *Mend the jigsaw clock* is self-explanatory with instant feedback when you get a piece in the right or wrong place. When complete you're asked to click on one of the arrows to set the clock going. This was a little complicated for some as it introduced the idea of clockwise and this is something I'd use as a reinforcement rather than introductory activity.

Set Bill's alarm clock asks children to match the picture and written time to the hands on the clock moving backwards or forwards to get to the right time. This makes good "o'clock" practice and a good starting point for talking about 8 o'clock in the morning or evening.

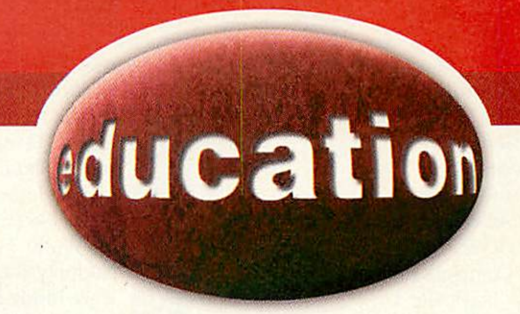
The activities are short and simple and, while the spoken instructions are clear, the graphics are rather basic. However, as a learning and teaching tool, they certainly inspire discussion in some while providing limitless and varied practice opportunities for others.

Time has become a difficult topic to teach as children are increasingly confused by the mixture of analogue and digital clock faces and the language they see and hear around them. This will not solve all the problems and as a tool for teaching time it is not as comprehensive as Topologika's *Talking Clocks*.

Yet *Numbertime Time* is particularly useful when it comes to the language we use when talking about time and as a package you can dip into or use for group work in the Numeracy Hour. **END**

Product details

Product:	Numbertime Time
Ages:	4-7
Price:	£27
Supplier:	Logotron, 124 Cambridge Science Park, Milton Road, Cambridge CB4 0ZS
Tel:	(+44/0) 1223 425558
Fax:	(+44/0) 1223 425349
E-mail:	info@logo.com
Web:	www.logo.com



Maths quest

Pam Turnbull looks at a resource that's just in time for the Numeracy Hour

Schools have been inundated with advice, offers and products aimed at making the implementation of the National Numeracy Project easier and less painful. However, Polydron seem to be the only company pushing a Mathematics Dictionary.

Paper-based versions can be found in every school, but does a CD-ROM version offer more? As with any multimedia reference, linking between topics is always going to be easier than the more traditional approach and we all expect animations, photographs and video clips. Well this one comes up with all of these essentials, but how about the content and value for money? What you actually get is three programs in one.

The dictionary element provides an a-z listing of everything from abacus onwards. Just click on your chosen letter and then access the word you need to look up. The pages appear instantly and have a clear and easy look to them. Each word has a speaker icon next to it which, when clicked, gives you the correct pronunciation. Beneath this is a page of text accompanied by an explanatory graphic - photograph, animation, video, drawing or diagram. Nice touches are the details on the root of a word, for instance *add* comes from the Latin *addere* meaning 'to put together'.

There is also a links button which, again in the case of add, gives you access to associated articles on: arithmetic, integers, plus, subtract, sum and total. Just click on the one you're interested in and you'll find yourself there. The definitions use clear language and the graphics are large and well used.



The video-style controls at the top of the screen allow you to scroll through sections. Using *Hyperstudio* as an engine for this program works very well and you can save and export graphics (but not videos or sounds), print by accessing the menu button or press Shift+F12 first to bring up the iconbar. Personally, though, I'd have preferred a multitasking window rather than a full-screen design.

However, there is more. The next section is a *Topic Resource* of data, tables and items of *unusual* information such as names for numbers in the dialect of the Lake District! These resources are copyright free and split into five sections: numbers for maths, special big numbers, everyday numbers, properties of shape and a general section. Make your choice and you can open pages on Fibonacci number sequences, googol, shoe sizes, quadrilaterals or useful formulae.

The final section is entitled *Games & Activities* and provides you with 42 geometry activities from *annulus* to *vertex*, 20 puzzles and 10 games to play. Click on what interests you and it is opened, via *Draw*, allowing you to change the colours, size, font and so on before printing, saving or importing into another program. There are some excellent puzzles in here for extension activities or homework.

Again, these are all copyright free and worth their weight in gold. It's true you can find some of them elsewhere, such as the Internet, but to have them together and easily accessible is a boon.

To recap there are over 460 dictionary definitions and explanations, with 50 pages of topic and resource materials as well as games and activities in a format that you can tweak or change to fit your class requirements.

The content is spot on for this age group and unlike a paper-based version has attractive graphics and links to take children (and adults) deeper into a subject. Highly useful, well presented and very relevant. A must buy! **END**

Product details

Product:	Mathematics Dictionary CD
Ages:	7-14
Price:	£35
Supplier:	Polydron, Zereau Ltd, Eaglescliffe Logistics Centre, Durham Lane, Eaglescliffe, Stockton-on-Tees, TS16 0RW
Tel:	(+44/0) 1642 867700
Fax:	(+44/0) 1642 867711
E-mail:	info@polydron.com
Web:	www.polydron.com

The Acorn Software Network

BUSINESS AND UTILITIES

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Personal Accounts V4	49.00
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Photo Real (Canon/Epson)	65.86
Photodesk 3	299.50
ProArtisan 24 (RPC Only)	89.95
Prophet 3	179.77
Rhapsody 4	94.95
Schema 2	121.50
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Sibelius 7 Student	345.00
Sleuth 3	116.32
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StrongGuard	25.00
Studio Sound	113.95
Tablemate Designer	60.00
TopModel 2	145.11
Turbodrivers (Can/HP/Eps)	54.69
WebSpider	40.00
WebTool for ANT Suite 2	29.38
WIMP Basic	44.99
Win95FS	41.12
XStitch 2	35.00

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Calabash Pirates	25.98
Crystal Rain Forest	50.17
DataSweet 3	69.33
Dazzle +	83.71
Dinosaurs (10/10)	13.49
Doodle	32.37
English (10/10)	13.49
Essential Maths (10/10)	13.49
Essential Science	13.49
Expl with Flossy the Frog	28.79
First Logo	38.95
Freddy Teddy's Adventure	23.50
French (10/10)	13.49
Fun School 3/4 (various)	24.99
Geography (10/10)	13.49
German (10/10)	13.49
Granny's Garden	28.79
James Pond Run. Water	27.00
Maths (Geometry) (10/10)	13.49
Maths (Number) (10/10)	13.49
Mega Maths	24.99
Micro Maths	24.99
My World 2 + 2	54.70
Naughty Stories Vols 1-6	44.65
New Teddy Bear's Picnic	36.78
Nursery Rhyme Time	33.43
Oxford Reading Tree 3	44.65
Pendown DTP	65.85
Playdays age 3-8	23.40
Playground (Freddy teddy)	23.50
Smudge the Spaniel	25.98
Spelling & Punctuation	13.49
Splosh+ (1-5 users)	51.70
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Revision 16



Tremolo a-go-go

Mike Cook creates a traditional sound

Last month we looked at a unique form of effects processor, this month I would like to take a look at a more traditional one. In fact the tremolo effect is one of the oldest in the book, pre-dating even transistors. In essence it is very simple, rapid repetitive amplitude modulation, or to put it in layman's terms, twiddling about with the volume control like a mad one. Most traditional tremolo controls use a voltage-controlled amplifier, where the voltage controls the gain and the output of an oscillator is fed into the control input to achieve the effect. You can control the speed of the effect by changing the frequency of the oscillator, and the depth by controlling the amplitude.

All very analogue and so far nothing to do with computers, but enter the digital potentiometer. This is just like a conventional potentiometer (pot) or volume control but instead of turning a knob to change the resistor tap-off point you feed it pulses.

There are one hundred tap-off points along the length of the resistor and a non-volatile memory, so the last point selected is remembered even with the power removed. All we have to do to make a tremolo effect is to feed our audio signal through one of these devices then feed it pulses so that it turns the volume up and down.

Now we could do this with our computer, but that would be a waste of computing power, a better approach would be to use a PIC, producing a standalone unit. You can try out the effect using your computer in place of the PIC if you want, I will describe that later. This project calls for a different PIC circuit from our standard crystal controlled/ serial interface affair. Instead of an accurate fixed frequency clock I have used a free-running oscillator, what's more its frequency is variable.

The cunning point of this is that we don't have to make any provisions for changing the speed of the tremolo in the software, all we need to do is change the processor's clock speed to alter the effect. There are a few other controls that need to be implemented in software: depth, shape and effect on/off switching. Let's got to Figure I to see the whole story. The PIC chip sits at the heart of things feeding pulses into the X9312 digital pot.

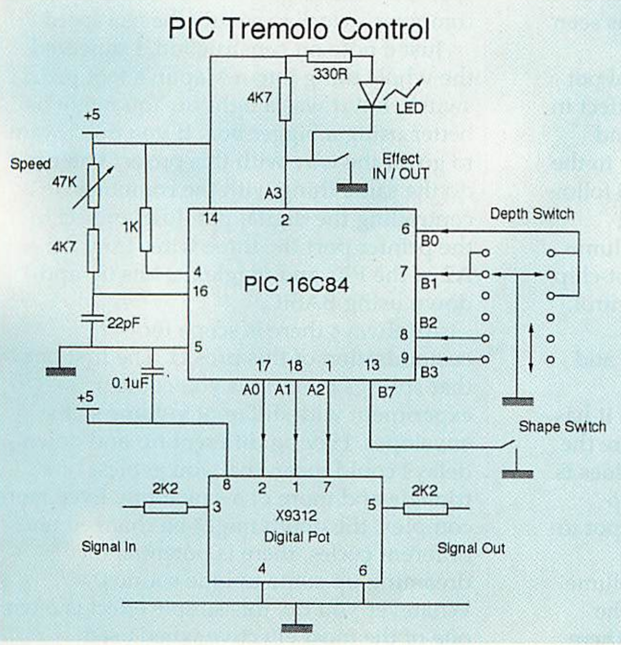


Figure I: The circuit diagram

On the input and output of the pot are two series resistors. These are not strictly necessary if the input and output are correctly wired up, but if these were to be swapped around then at minimum depth there would effectively be a short circuit across the input signal, drawing enough current to damage the digital pot – this is exactly what happened with the first draft of this circuit.

The effect in/out switch is also connected to an LED so that you have visual confirmation of the state of the effect. One advantage of this circuit is that there is no click when the effect is switched in or out, unlike traditional designs.

The only thing that looks slightly complicated is the depth switch, this is a two-pole, six-way rotor switch, and you might ask why? Well, simply because I had one of these in stock at the time I was designing it. There are enough inputs for a single-pole six-way switch or, for the more wealthy, a BCD switch. All we need to do here is



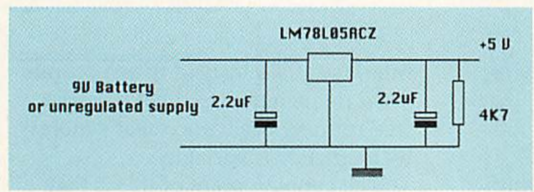


Figure II: The power supply

to have some way of indicating a number to the software, which can then sort out what it means. If you want to draw it out you will see that if we look at inputs 0 to 3 the software will see the hex numbers 7, B, F, E, D, C as the switch is rotated. This number is used to look up the correct number of pulses to feed to the pot.

The more pulses it is fed the lower the volume goes and so the tremolo depth is increased. To make the look-up table slightly more efficient 15 is subtracted from each number and only the four least significant bits are used, giving the numbers 8, 4, 0, 1, 2, 3.

As there are 100 steps to the digital pot these depth numbers should range from 0 to 100, and don't forget that these numbers refer to the setting of a linear volume control whereas the ear perceives in a logarithmic fashion. This means if you were to spread the depth numbers out evenly you would not hear an even change in tremolo depths. A bit of experimentation revealed that the numbers 25, 50, 63, 75, 87 and 100 produced good results. Finally to round off the hardware you need some sort of power supply. As the PIC needs 5 volts you need to use a regulator, this is shown in Figure II. It uses a standard 3-pin regulator and can be fed from either a 9 volt battery or an unregulated 9 volt supply. Now let's see what we need to do to drive it, Figure III shows the circuit as seen by the program.

Port A is used to control the digital pot and to see if we need to switch the effect in or out. Port B is used for the depth and shape control. Now you should refer to the assembler listing on the cover disc to follow what is going on. Controlling the pot consists of setting the direction of volume up or down, putting a zero on the not-chip-enable and pulsing the increment control. This is all done in the 'Increment' subroutine which toggles the signals and implements a fixed delay.

When the unit is first switched on it has no idea of how the pot is set, therefore the first thing it does is to send 100 up pulses to the pot to ensure it is at maximum volume. Next it tests the shape input, there are two shapes of tremolo implemented, these are shown in Figure IV. The simplest is a volume ramp up and down, with the alternative shape holding the volume on full for the length of time it takes to ramp up. This is done by the 'Hold' subroutine which essentially has all the delay of the 'Increment' subroutine but with none of the bit-toggling.

Port A | Port B
A3 A2 A1 A0 | B7 B3 B2 B1 B0
Effect in / out, CE, INC, Up / Down | Shape, Depth

Figure III: The programmers model

If the shape switch is at one, the 'Hold' subroutine is entered, otherwise it is skipped. With the volume now at maximum the effects in/out or bypass switch is tested, if it is a 1 the program enters an endless loop just testing this bit. Thus the volume stays at a maximum and so in effect the tremolo is off. This is quite cunning and ensures that the switch over from effect to no effect is clean, synchronised to the tremolo and never causes a click.

Now it is time to ramp the volume down so the depth switches are read and the number of pulses required are extracted from the look-up table. In order to keep the tremolo frequency independent of depth a look-up table is also used to find a delay value. If this were not done changing the depth switch would also change the speed. Setting the up/down pot control to down, the same 'Increment' subroutine is then called. The program now loops round and repeats this over and over. Note how the depth is only changed when we are at the top volume and that we always go up the same number of steps as we went down. In this way the pot never loses its place. All this is done at a fixed speed, remember you have control over the computer's clock to control the real speed.

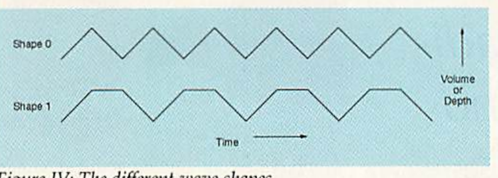


Figure IV: The different wave shapes

Just a note on construction, I squeezed the whole thing into a Maplin's foot pedal switch, but it was a tight fit. You might be better using a bigger box. If you don't want to go all the way with this project you can do the same thing with the computer controlling the digital pot. Just connect to the printer port the three wires from A0 – A2 of the PIC and toggle the bits up and down using BASIC.

As always there is scope for customisation of this project. The first one that springs to mind is you could experiment with different volume shape envelopes. Having different up and down delays could mean that you get less of a triangle and more of a saw tooth. Even more complex, the depth might be changed on different cycles, there is potential for dreaming up some unique sounds. Whatever you do, this simple effect is often one of the most effective when used on a voice or electric guitar. END



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Rambles though Acorn Wood



Mike Cook ruminates on RISC OS matters

Let's kick off with a bit of feedback from Martin Hodgson:

"S.I. Evans, in his query, asked (among other things) how to use the *Quake* PAK files in *ArcQuake6*. The answer is *QunPack* from Stuart Halliday. Send a £1 coin and your e-mail address to S. Halliday, 35 Pinewood Park, Livingston, Scotland, EH54 8NN. He will e-mail a password to you.

"Find his Website (http://www.cybervillage.co.uk/acorn/qs/) and, using the password, download QUNPACK.ZIP. Unzip the download (I used *SparkFS*) and there you will find two applications – one for the shareware version of *Quake*, and one for the full version. The latter will also deal with the add-on PAKs from people like Hipnotic.

"Run the compressed pack on the game CD through *QunPack*. Place the two resulting PAK files (PAC/0 and PAK/1) in the *id1* directory inside *ArcQuake*, and you are ready to go. As far as I know this is the only way to get the *Quake* CD PAK files unpacked and ready for use on RISC OS.

"There are a few applications that will allow you to look inside the PAKs, but these will not unpack the file as supplied on the game CD. You have to use *QunPack*."

Jonathan Pritchard has several questions: "Firstly I have a small query about my stereo, a headphone plug and my Risc PC's or A3010's parallel/serial port. It goes like this: if you could take the analogue (at least I think they are analogue) signals from the stereo's headphone jack to the computer and somehow save them as data, could they then be played back on *Player*?

"I've noticed if I ask it to play something it doesn't understand it plays it as 'raw data'. Or even better could that data be converted to a proper music file?

"If any of this is possible I've then got a relatively cheap way of getting old tapes stored digitally on my harddisc or a floppy. Of course it would probably be better and easier to just buy the necessary hardware and software (if there are such products available for my Acorns), which brings me to my second query:

"Where can I find the necessary books on how to get data from the parallel/serial port and to learn how to program multitasking WIMP applications? Or do the PRMs contain all I need to know? At the moment all I do is program simple BASIC programs, such as coloured circles which change colour and bounce off the edge of the screen.

"Do you know why the copy of *Studio24* which came with my Risc PC crashes with the error 'Studio24 has suffered a fatal error (type-5) and must exit immediately'. This occurs when I try and save a picture as an 8-bit sprite (and sometimes annoyingly resets the desktop font back to System). Is this really bad or does it just say 'fatal' for effect?

"And lastly, my Risc PC is one of the 'Web Wizard' Risc PCs and came with a 15in monitor similar to an AKF65. After finding *MakeModes* on one of the *Acorn User* cover CDs I decided to have a go at getting 1280x1024.

"I achieved 55hz, which is one Hz under the standard 800x600 32-bit mode. Afterwards looking at the manual I found the monitor wasn't meant to display anything higher than 1024x768, is this warning just for safety?"

You need some form of analogue-to-digital converter to feed the audio signals into your computer. Depending on the quality you'll need an 8-bit one or a 16-bit one. The 8-bit converters tend to be around



the £30 to £50 mark and are good for speech or 'transistor radio quality', while 16-bit converters are in the £130 – £250 range and fit in a podule connector. Depending on the number of bits and sample rate you could need up to 10Mb of disc storage per minute. Not really a cheap way of storing tapes.

The PRM will tell you all you need to know but it won't tell you how to program. In other words it tells you what all the operating system calls do but does not tell you anything about the BASIC structure you need to embed it all in. Having said that, I learned how to do it from looking at the PRMs and examining some of the Acorn supplied applications.

There have been several books about Wimp programming but they are out of print, except for one by Ray Favre which is up-to-date. Check out his Website at http://homepage.eurobell.co.uk/rayfavre/

Alternatively you can buy a programming environment. There's *WimpWorks* from Jaffa Software which uses real BBC Basic with extension libraries, or Clares' *WIMP BASIC* which is a completely new variety of Basic. The error in *Studio24* you will have to refer to the makers, but my guess is that you are not in an 8-bit mode when you try to save an 8-bit sprite. Yes I know it shouldn't make a difference, but maybe the programmer didn't know how to do it in a mode-independent way, or maybe there is some other valid reason. In any case the term 'fatal' refers to the heath of the running application nothing else. Basically it means that the error is unrecoverable.

The resolution quoted for a monitor is derived from the phosphor dot pitch (how close the dots are to each other) and if it is exceeded the display might suffer from aliasing and thin single pixel vertical or horizontal lines disappearing. It's not a safety issue.

On the other hand things like maximum line rate or refresh rate depend on the hardware in the monitor. Often they are just the maximum rates that can be used and you still produce a display that fills the screen, but sometimes exceeding them can cause undue stress on the electronics and bring about, if not immediate failure, then a shortening of the components' life.

Jonathan came back to say:

"I thought the raw data would take a lot of memory but I didn't know how much. Switching to a 8-bit mode did stop the error on *Studio24*, but now I've noticed that exactly the same error occurs on *Voyager* (v2.03) when viewing Web pages, 'Fresco has suffered...'. Are these two errors linked in any way, or is it just the computers way of saying it doesn't want to run this program anymore?

"The errors in *Fresco* seem to be random and are even more annoying; a couple of times its quit *Voyager* as well as *Fresco* leaving the modem on line with no way to get it off except turning it off and resetting the machine. Anyway what does Error Type-5 mean?"

A good question. It would be great if someone could generate a list of error numbers but the problem is that so many calls to the operating system generate the same error number – or rather returned bit pattern, that producing a list is impossible without knowing the cortex that invoked it. In short, sorry I don't know. END

William Holt has been having a dabble at construction. He first contacted me to say:

"I've noticed your Run the RISC light pen article, its just what I was looking for. I was just wondering, what's the difference between PIC16F84 and PIC16C84, and do I use the same programmer from the September 1997 issue? Also what is a Max 202?"

Yes, all the PIC projects use the same programmer from that issue. The difference between the two parts is that the F can be used with a faster clock crystal and has a few more registers.

They both program the same except that the F has an inverted flag for *power-up rise time delay enable* (PWRTE).

As this should nearly always be enabled it is ticked when programming the C device and crossed for the F part.

A MAX 202 is an RS232 level driver which generates the plus and minus voltages needed to drive the serial interface from a single 5V supply. It has two inputs and two driver outputs.

A few days after this exchange he wrote again:

"I've built your light pen circuit, but I can't get it to work. I looked at your listing for the program and I noticed an extra part for a test LED.

"I connected an LED to the circuit and it doesn't light. This makes me think the PIC isn't working."

It could be the PIC but more likely it sounds like the sensor not picking up the raster.

The LED should be connected to pin 3 (port a, bit 4) through a 560R resistor to earth and should light when the pen gives a pulse. To test this, disconnect the sensor and fit a switch so you can simulate a detected signal.

Note, you might have to turn up the brightness on your monitor and use a white patch on the screen to get enough light to trigger the sensor.

If you want to make sure the PIC is working write a small routine to flash the LED. There was one on the disc of the September '97 issue.

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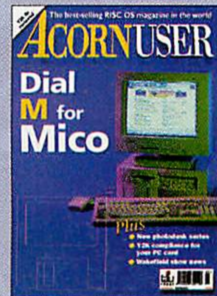
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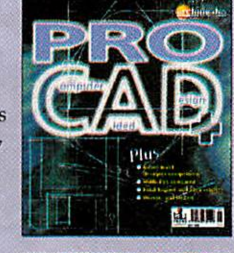
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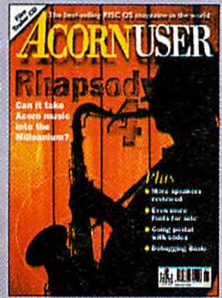
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PD documentation

Just read the 'PD direction' article in the July *Acorn User* and I agree that the user interfaces for many programs need to be redesigned; some even just designed. I've been irritated by poor interfaces in Acorn software for a long time and have stopped using many programs simply because I have to dig deep into some subfolder just to locate the 'errsnd=1' line in the Config file. This not only applies to PD or freeware software; many shareware and commercial programs have that annoying 'feature', the ANT *Internet Suite* to name but one.

I actually argued about this problem with a well-known shareware author on Usenet a while back and he defended his view by saying that he'd rather spend time putting more features in his programs than making them easier to configure – what use are new features if a normal user has no access to them without delving deep into the technical documents?

He even went as far as to say that adding a configure option in programs would take up too much valuable memory! I respect this author highly but this is just rubbish. It's not as if we're stuck in 32K anymore. I know many users have limited memory on their machines but why always develop software for the lowest spec available? Software should encourage people to upgrade their machines every once in a while.

I think it's great that people can still use their old Archimedes 305 to do most of their stuff, but maybe that's why the RISC OS market has never really managed to grow – people just hang on to their old machines forever resulting in fewer new sales. Software for RISC OS, in my opinion, looks far to often like an unfinished alpha version from an amateur programmer.

Maybe the trend was set by Acorn with the Programmers Reference Manuals, they're probably easy to use for the skilled RISC OS programmer but for a programming novice they're just a waste of money! I sincerely hope software developers will be designing their programs with the users in mind in future. Many of them actually develop programs with well designed user interfaces, but for some reason there always seems to be a hidden option in the config file that adds that extra spice to the program.

Gunnlaugur Jonsson, by e-mail

Perhaps a simpler and less accusative solution would be implementing a standard config file format and then having a separate config program that just read the file and allowed the user to change the settings – the config file format would also include information on how to present the config information from simple windows to complex Windows-style tabbed.

The routines for reading and writing to a config file data would also be standard and put into a module. Then programmers would not have to write their own config code which, after all, is only re-inventing the wheel. In fact this type of thing has been done at least once in a screen-saver program.

The overworked programmers at RISC OS Ltd wouldn't have time to do this (at least it wouldn't be very high on the list) so it's definitely one for PD.

Steve Turnbull

No weak solution

I wholeheartedly agree with Bob Ardler (PD direction, *Acorn User* July 1999) when he says that Acorn ports of programs like *TeX* are under-used because of a lack of comprehensible documentation.

I would however take issue with the Editor when he suggests in the same piece that effective documentation is a 'weak solution' to this problem.

Granted, documentation can only usefully complement those apps with 'good interface design', but quality documentation can also serve as an advertisement for our platform as well as for a particular piece of software. I think for example that the success of Linux can be partly attributed to the quality of documentation which is available for it.

The development of Linux also shows that computer-related writings can have an inspirational effect upon the reader, with the result that an OS and related software increases its market share. The sceptical reader has only to think of the influence which Eric Raymond's essay 'The Cathedral and The Bazaar' has had on Netscape's decision to release the source for *Communicator 5.0*.

With the above points in mind I would humbly like to offer the following suggestions:

- Initiate a RISC OS Documentation Project. This project could be modelled on the Linux Documentation Project and would provide a repository for manuals and all other sources of written information relating to our platform. It would also provide an opportunity for experienced users to document their use of a particular app.
- Encourage flagship developers to release substantial portions of their documentation into the public domain.

Both of these suggestions, if implemented, would go some way towards reasserting the idea that good documentation is at least as important as excellent software. My second point would also show Windows users what they are missing.

Paul Webb, by e-mail

Overlooked

I was interested in comments in the August *Acorn User* regarding overlooked applications for RISC OS. I would have to agree, but at least David Pilling now has control of *OvationPro*, so we can expect continued development. He's said as much on the *OvationPro* mailing list.

Eureka is a problem application. Of all the spreadsheets available for RISC OS machines, this is the bees knees and stands somewhat above all similar products. Unfortunately, development work on *Eureka* ceased long ago, at least two years now, so it seems there is no possibility of further enhancement/development work on it. Support is still available for registered users, but it's excruciatingly slow.

Impression Publisher... well despite being a bit old now, and bearing in mind I've converted at least 95% of my business and personal paperwork to *OvationPro*, I still find myself using *Impression Publisher* for some things. As marvellous an app that *OvationPro* has become, there are certain areas where it's not good. One particular thing that



troubles me is lack of Contents and Indexing...sure there are a couple of third party applets that attempt to do these things, but they do so very badly.

The older programs really need to be picked up and overhauled.

Dave Symes, by e-mail

MidiWorks query

My son has been having problems with Oregan Development's *MidiWorks* ever since purchasing it at Acorn World 1996. We have had protracted negotiations with Oregan but despite installing a new copy we still can't get it to run.

We have a StrongARM Risc PC with an ACE MIDI Connect card which works fine with *Maestro*, *Notate*, *Rhapsody* and *Melidi*. ACE say that if *Notate* works then *MidiWorks* should also work. The card clearly works because *MoniMIDI* displays all the MIDI data from the Roland keyboard.

MidiWorks installs on the iconbar and when a file is loaded the reel editor and transport panel appear, but as soon as the play button is activated the error message 'internal error, no stack for trap handler: >> Data Abort, pc = 2001B7F: registers at 000440D8' appears and the computer is disabled.

Worse than this, when part of a track is highlighted on a new reel and play is selected the cursor stops at the beginning of the highlighted area, the computer is disabled, and the whole thing requires a reset. Does anyone have experience of this problem? We would appreciate help.

Peter Halford, by e-mail

Mike B. correction

In last month's *Acorn User* the lovely Mike Buckingham was credited with a nice three page article on a Linux-based Internet server – *Netpiilot*, page 21, Issue 210. Unfortunately Mike Buckingham didn't write the article, Mike Battersby did.

Many apologies to Mike B. and Mike B. (you can see how it happened), and don't worry, the correct person will receive the pay cheque. Unless I make it out to Mike Cook, of course …too many Mikes!

Dunstan Orchard

Dear Bob and Trev

Katie and a bearded man found me lying in the middle of PC World's software department. It was early morning. I often go there for a game of Spot the Acorn when I want to feel depressed. Sometimes the store manager puts a copy of *Sibelius* there to make me feel better. This time it only made me feel worse.

"You look terrible." Katie told me.

"It's because of my new job," I explained. "I'm porting Windows to the BB2C Micro. It's all part of Microsoft's new initiative to take over the British education market."

That wasn't exactly true. I *was* working in Microsoft's 'Platforms of the Future' research lab, but I was working as a spy. Most of the people working there are spies, affiliated to one organisation or another. I didn't actually know who I was spying for; that was all part of the contract. I wondered if that was why I hadn't been paid yet.

Of course, I had only recently moved there. Like many others, I was previously located in Acorn's R&D department, but since that went all Mandelson on us the major IT companies have had to look elsewhere for ideas to steal. It seems laughable that anyone should think of Microsoft as a source of new ideas, but apparently these are the depths the industry has sunk to.

"You're invited to a party. We're celebrating the demise of Acorn by making the RISC OS market stronger than ever. Nigel will be coming." She tugged the man's sleeve. "Nigel is the saviour of RISC OS."

I recognised Nigel Taylorman from his photographs in the press. His plan was to buy up all the unsold Electrons and convert them to run RISC OS 4. The hardware wasn't cutting edge, but as he said in an interview, "Apples can't use floppy discs either."

I arrived late to the party. All the people there were either short, fat programmers with big hair and no life, or retired schoolteachers (the sort who pretend to like Acorns, but who really want a Mac and can't afford one). All the talk was of the recent Clinton-esque scandal at *Acorn Abuser*. Apparently it all started when the deputy deputy deputy editor told the receptionist to 'hold his calls and sack Mike Cook'.

Nigel was surrounded by a gaggle of transvestite students, demonstrating a motherboard and tangle of wires. I asked him what he was holding, and he said it was the new ElectronStation. It was only a prototype, and some of it was held together with paperclips and sellotape. He talked for what seemed like hours about clock speeds and random heuristics, but I paid little attention because usually I only interact with people using e-mail, and all this socialising was making me feel dizzy.

All I wanted to know was what the case would look like. Nigel called me a doormat, and explained how he was extending upon the style of the iMac's see-through case, by giving the ElectronStation no case at all. It would set a trend throughout the industry. After the crowd finished applauding his words he gave an embarrassed wave and wandered away, muttering the word "Boland".

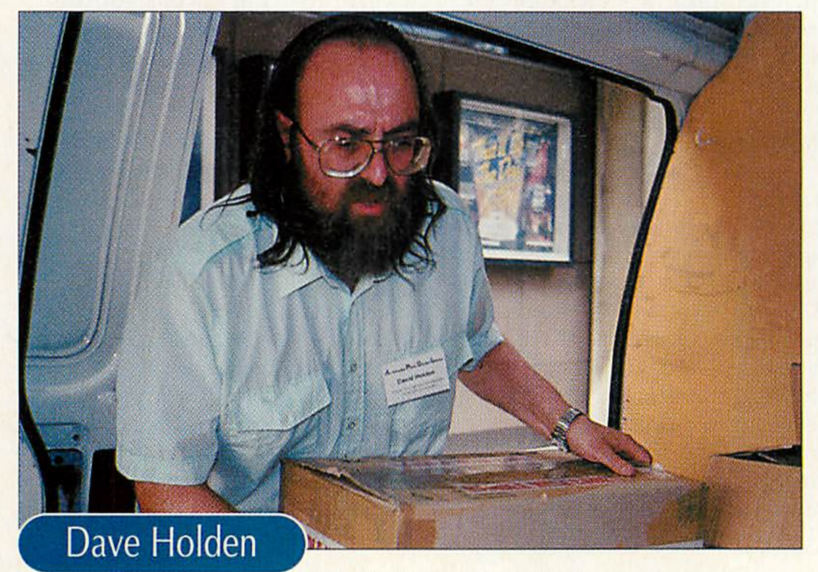
Then a marketing executive named Tony came up and whispered to me how the ElectronStation could run its own software 500% faster under emulation than it could natively, and that George Lucas wanted one to produce the special effects for the next Star Wars movie – all this was highly confidential. The news was so top secret that it was only broadcast on Channel 5, just in case somebody saw it.

Suddenly the atmosphere turned nasty. David Mattermush, a networking professional, was shouting and throwing pasta at everyone. He became famous for connecting his ZX-81 to the Internet using yoghurt pots and string. He was angry because his latest attempt to connect all the computers in his street via the washing lines had failed, and here, standing by the buffet, the spaghetti was the final straw.

He could see its potential bandwidth, but Rosemary Brovario was claiming it was all her idea, only hers was better because her husband was Italian. The fight culminated with David grabbing the ElectronStation and using it to cut the spaghetti into tiny pieces.

"Just think, none of this would ever happen if you all run Windows." mused Nigel. I was the only one who agreed. On my way out, a stranger punched me in the mouth.

Jack Cumpstey, by e-mail



Dave Holden

I doubt that Dave Holden needs much introduction. Admittedly he's called Dave and he has a beard, which hardly makes him unique in the Acorn market, but the owner of APDL has been a familiar face at Acorn shows for many years now. "I started out writing Shareware programs," recalls Dave, a member of the Association of Shareware Professionals. "In fact, I probably wrote the first Shareware program for the Acorn. At that time, APDL was run by Peter Sykes, who then had to quit because he'd taken a new job.

"I thought: 'Well, I'll give it a try – a couple of evenings a week and perhaps Saturday.' I was self-employed, so even if it took a whole week updating the catalogue, it wouldn't matter. Gradually it took over, until now it's about nine-and-a-half days a week."

> *He's called Dave and he has a beard*

Back problems were making Dave less able to do his main job as an electrical contractor, so he welcomed the increasing role APDL played in his work. He still has souvenirs from his old job; at the Acorn South East Show his computer was balanced on a couple of rolls of electrical cable, and the white van he drove to and from the show also dates back to then.

These days APDL is far more than just a PD library. As well as selling cheap software in the £10 to £20 bracket, Dave sells increasing amounts of hardware, especially IDE interfaces and devices. He originally started selling IDE hardware as a form of protest against what he saw as vastly inflated dealer prices; gradually it's become a more profitable side of the business.

"I deliberately don't separate various bits of the business out when I'm doing the accounts, because if I did I'd probably discover that I'd be better off dropping the PD library aspect of it. I don't want to do that, not just for historical reasons, but because I think it's something that someone *ought* to do." Many people might think that a PD library should be a non-profit organisation, but PD libraries never have been so. Until recently PD libraries were very profitable indeed, which is why there were so many of them, even in a such a relatively sparse market as the Acorn one. (Incidentally, Dave ascribes the sparseness to the fact that, unlike on the PC, there are relatively few holes to plug in RISC OS. He points out the wealth of PD that was available to do things with RISC OS 2 whose functionality was incorporated into RISC OS 3: file-typers, sticky backdrops and the like). PD librarians are providing a service, and need to make enough money to eat, drink, and buy new clothes, although Dave claims that the one time he turned up at a show in a new pair of trousers, people didn't recognise him. At the South East Show he was wearing a well-used and highly practical pair of combat trousers, into which he squirreled receipts, cash and discs.

Both the price and volume of discs sold have plummeted over the past four years, meaning that the PD library alone would probably be unable to pay for its advertising. Unsurprisingly, Dave believes this has been caused by the growth of the Internet and the availability of cheap CDs.

"On the PC, there are various well-known brands that bring out a CD monthly and bi-monthly, because there is so much new software that you can create a new CD with each release. That's never going to be possible in this market, so when I did a CD, I did it on the basis that it would be updated each time I did a new run; rather than trying to create a completely new disc I'd just remove some software and replace it with new stuff.

"The worst thing that's been happening to PD and Shareware recently is that people have been porting stuff and just dumping it. The earlier ports of programs like *TeX* and *GNU C* were properly Acorn-ised. Now somebody cross-compiles it and leaves you with this command-line program with no information on how to use it except the original PC or Unix help files, which are only of use to you if you also use a PC or Unix.

"This trend has happened almost entirely because of the Internet. Five years ago the means of distributing that software was PD libraries, and there was a filter there: people like me. I'd probably write back to the author and suggest improvements that could make it easier to use. Now the software gets dumped on someone's Website, people try to use it, don't get anywhere with it, and just get annoyed. The filter that the PD libraries provided has largely vanished." It's not quite gone yet, though. Dave remains as the custodian of the largest PD library for RISC OS, and while he does so, potential PD authors would be well advised to make use of his talents as a filter. The PD scene will be the better for it.

David Matthewman

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